

HANDLE For DISPLAY:

MORTON MACHINE WORKS

1-800-441-2751

PIN AH-101 #10-24 Thread.

LSTC

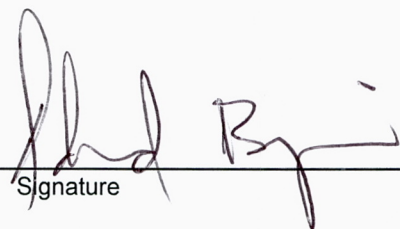
ORIGINAL CERTIFICATE IN 458

STC

ORIGINAL CERTIFICATE IN 444

## DECLARATION OF CONFORMITY WITH THE CERTIFICATION BASIS

In accordance with Canadian Aviation Regulations Subpart 521, I hereby declare that the design of the DynaNav System Installation, as detailed in the data approved by Transport Canada approval SH02-26, has been demonstrated to conform to the best of my knowledge to the basis of certification established by the Minister for that approval.

per:  \_\_\_\_\_  
Signature

E. Burgoin

Print Name

Consultant

Title

18 October 2011

Date



MINISTERIAL DELEGATE STATEMENT OF COMPLIANCE  
WITH THE CERTIFICATION BASISDÉLÉGUÉ MINISTÉRIEL CONSTAT DE CONFORMITÉ  
AVEC LA BASE DE CERTIFICATION

1. Reference No. / N° de référence NAPA File C- Aero Design Project #598		2. Applicant Name / Nom de demandeur Aero Design Ltd.	
Part 1: Identification of Aeronautical Product Partie 1 : Identification des produits aéronautiques			
3. Applicable Design Approval Document No. / N° du document d'approbation de la conception applicable H3WE, H-95			
4. Model No. / N° de modèle 369D, 369E, 500N		5. Make / Marque MD Helicopters Inc.	
6. Type (aircraft, engine, propeller, appliance, part) / Type (aéronef, moteur hélice, appareillage, pièce) Helicopter			
Part 2: Substantiating Reports and Data Partie 2 : Rapports et des données pertinentes			
7. Number / Numéro DCL598-1 Revision 2		8. Title / Titre Document Control List, and all documents referenced therein.	
59803, Revision 1		DynaViz Display Installation	
59821, Revision 2		Hinge Assembly	
9. Purpose of Finding of Compliance / But de la constat de conformité <div><input type="checkbox"/> New approval: <input type="checkbox"/> Supplemental Type Certificate <input type="checkbox"/> Supplemental Type Certificate-Limited <input type="checkbox"/> Repair Design Certificate <input type="checkbox"/> Other: (briefly describe the applicable findings)</div> <div><input type="checkbox"/> Revise existing approval # SH02-26  No The revised data requires the revision of the approval document. Yes The revised data is within the scope of the accepted Certification Plan.</div>			
10. Applicable Elements of Certification Basis / Éléments applicables de la base de certification <input checked="" type="checkbox"/> Certification Plan: CP598, Rev. 1 <input type="checkbox"/> Letter of exention of delegation, dated:			
Part 3: Ministerial Delegate Finding of Compliance with the Certification Basis Partie 3 : Délégué ministériel constat de conformité avec la base de certification			
Under the authority vested in me by the Minister under subsection 4.3(1) of the <i>Aeronautics Act</i> , I hereby find that the type design of the aeronautical product is in compliance with the certification basis as demonstrated by the applicant's substantiating reports and data to the best of my knowledge. En vertu des pouvoirs qui m'ont été conférés par le ministre conformément au paragraphe 4.3(1) de la <i>Loi sur l'Aéronautique</i> , j'estime que, à ma connaissance, la définition de type du produit aéronautique est conforme à sa base de certification tel qu'il a été démontré par les rapports et les données pertinentes fournis par le demandeur.			
11. Signature of Delegate(s) Signature des délégués	12. Name / Nom	13. Delegate No. / N° de délégué	14. Date (yyyy-mm-dd) Date (aaaa-mm-jj)
	E. Burgoin, Aero Design Ltd.	DAR 290M	18 October 2011



**Steven Fahey**

---

**From:** "Aero Design" <info@aerodesign.ca>  
**To:** "Lindsey Gebauer" <lindsey\_gebauer@greatslaveheli.com>  
**Sent:** April 1, 2008 1:54 PM  
**Attach:** 59807\_0.pdf; 59806\_1.pdf  
**Subject:** Re: C-LSH01-132/D

At first I was worried about getting into a conflict between earlier vs. later drawing versions not matching your actual installations, but the difference seems to be minor.

The most recent drawings are these attached.

'Til next time.

Steven Fahey, CET  
steve@aerodesign.ca  
Aero Design Ltd.  
2013 - 39th Avenue NE  
Calgary, Alberta, Canada  
T2E 6R7  
(403) 250-8027

----- Original Message -----

**From:** Lindsey Gebauer  
**To:** 'Aero Design'  
**Sent:** Monday, March 31, 2008 1:03 PM  
**Subject:** RE: C-LSH01-132/D

Hi Steve, the LSTC seems to cover the machines we have the equipment installed on. PDF format works great for me. Cheers.

Lindsey Gebauer  
***QA Inspector***  
Great Slave Helicopters Ltd.  
1 (867) 873-2081 Ext. 208  
1 (867) 669-7338 (Fax)  
lindsey\_gebauer@greatslaveheli.com

---

**From:** Aero Design [mailto:info@aerodesign.ca]  
**Sent:** Monday, March 31, 2008 2:21 PM  
**To:** Lindsey Gebauer  
**Subject:** Re: C-LSH01-132/D

You are referring to a LSTC for your helicopters, but you could also refer to the full STC which approves basically the same thing.

The LSTC isn't rescinded - so you can refer to either configuration.

Yes, there are revisions to some drawings, but you basically have a good set, considering what you needed and ordered last time around.

The two missing drawings from your file may not have been needed or provided, then. Anyway, if you need or want to change configuration on a new install, you can refer to the new drawings.

I can send you a set of drawings on paper, or in PDF. Which do you prefer?

# AERO Design Ltd.

Contact Info: info@aerodesign.ca

STC #	Description	Documents On Record	Required Information
C-LSH01-132/D	DynaFlight Seisbag System	Master Document Control List DCL598 Rev 0, Drawings 59801, 59802, 59803, 59804, 59805, 59808, 59809, 59880 All Rev 0	Drawings 59806, 59807 Rev 0 or later, Any other documents, or any later Revisions? ✓

APRIL 1 2008



Transport Canada

Transport Canada

**Department of Transport**

# *Limited Supplemental Type Certificate*

**This approval is issued to:**

AERO Design Ltd.  
2013 - 39 Avenue, N.E.  
Calgary, Alberta  
Canada T2E 6R7

**Number:** C-LSH01-132/D**Issue No.:** 6**Approval Date:** August 13, 2001**Issue Date:** September 29, 2005**Responsible Office:**

Prairie and Northern

**Aircraft/Engine Type or Model:**

AEROSPATIALE AS 350B2,  
EUROCOPTER AS 350 B1, AS 350 B3, AS 350 BA,  
MCDONNELL DOUGLAS HC 369D, 369E

**Registration/Serial No.:**

C-FGSC/3067, C-GGSW/2675, C-GGSY/3591, C-GYFS/3868,  
C-GFHN/2128, C-GGSP/2126, C-FYZF/3823, C-GAVO/3139,  
C-FHAF/1543, C-GABX/2438, C-GHMZ/2325, C-GIUX/1240,  
C-GRTL/1377, C-GRTM/1402, C-FERA/980346D,  
C-FGHS/1098D, C-FGHT/1099D, C-GCKV/570141D,  
C-GIKB/711015D, C-GLHW/110888D, C-GMNU/380271D,  
C-GMTB/310918D, C-GNMG/300693D, C-GOPC/1280405D,  
C-GRYW/190451D, C-GVZD/1070209D, C-GWPK/300676D,  
C-GVSW/0011E

**Canadian Type Certificate or Equivalent:**

AEROSPATIALE H-83  
EUROCOPTER AS 350 B1, AS 350 B3, AS 350 BA H-83  
MCDONNELL DOUGLAS HC 369D, 369E H3WE

**Description of Type Design Change:**

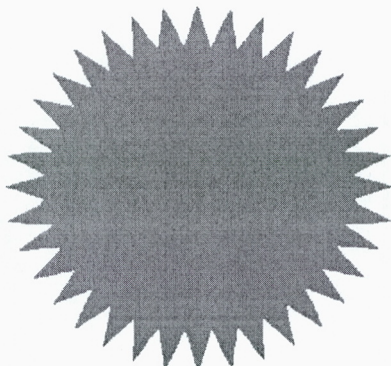
DynaFlight Seisbag System Installation

**Required Equipment and Limitations:**

AS350: Installation of the DynaFlight Seisbag System to be completed in accordance with Transport Canada approved, AERO Design Ltd. Document Control list, DCL458, Rev 1, dated 29 June 2005 or later approved revision.

Basis of Certification for installation is FAR 27, at amendment 27-10.

**Conditions:** This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated **will not** adversely affect the airworthiness of the modified product.



E. Burgoin, DAR 290M  
For Minister of Transport

**Canada**



NOTE: THIS ADDENDUM SHALL REMAIN PART OF THE CERTIFICATE REFERRED TO THEREIN.

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369: Installation of DynaFlight Seisbag System to be completed in accordance with Transport Canada approved, AERO Design Ltd. Document Control List, DCL598, Rev. 0, dated 6 February 2004 or later approved revision.

Utility Power Provisions installed in accordance with drawing 59809 may remain installed if the DynaFlight Seisbag System is removed.

Basis of Certification for installation is CAR 6 at amendment 6-4.

- End -

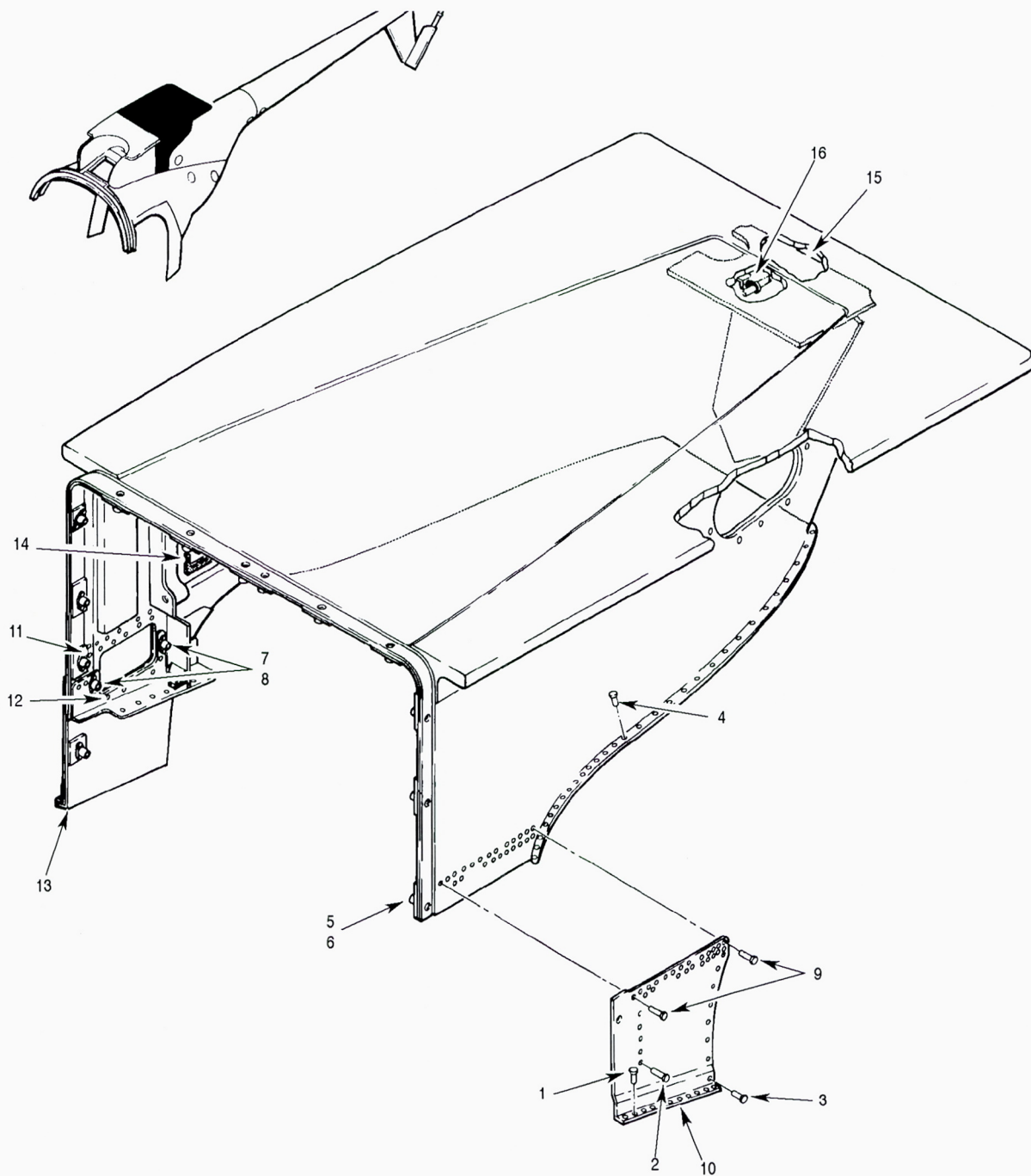




JEFF

Here is a sample of AH-101

Tom



P53-3015

Figure 1. AFT Engine Inlet Fairing Assembly – 369D/E/FF

I L L	Fig. No.	Item No.	Part Number	Description	Qty. per Assy.	Used on Code	Model / Serial No. From - To
	1		369D293053-23	• Fairing Assy, Engine Inlet, Aft ..... Ref 06-20-00 For NHA	REF		D 000001-SUBS E 000001-SUBS FF 000001-SUBS
	1		369A3053-505	• • Fairing Assy Engine Inlet, Aft Section ...	REF		D E
	1	1	MS20470AD4	• • • Rivet, Solid-Universal Head .....	AR		D E
	1	2	NAS1738B4-1	• • • Rivet-Blind,Protruding Head,Mechanically Locked .....	AR		D E
	1	3	MS20470AD3	• • • Rivet, Solid-Universal Head .....	AR		D E
	1	4	NAS1738B4-3	• • • Rivet-Blind,Protruding Head,Mechanically Locked .....	AR		D E
	1	5	MS20426AD3	• • • Rivet, Solid, Countersunk .....	24		D E
	1	6	NAS697A3	• • • Nutplate .....	12		D E
	1	7	MS20470AD3	• • • Rivet, Solid-Universal Head .....	4		D E
	1	8	MS21076L3	• • • Nut,Self-Locking,Plate,Two Lug,Floating .....	2		D E
	1	9	MS20470AD3	• • • Rivet, Solid-Universal Head .....	AR		D E
	1	10	369A3053-91	• • • Panel, LH .....	1		D E
	1	11	MS20426AD3	• • • Rivet, Solid, Countersunk .....	AR		D E
	1	12	MS20470AD3	• • • Rivet, Solid-Universal Head .....	AR		D E
	1	13	369A3053-129	• • • Panel, RH .....	1		D E
	1	14	369A3053-137	• • • Seal .....	1		D E
	1	15	369A3053-143	• • • Antenna .....	1		D E
	1	16	MS17821-1-9	• • • Strap .....	5		D E





## Department of Transport

# Supplemental Type Certificate

This approval is issued to:

AERO Design Ltd.  
2013 - 39 Avenue, N.E.  
Calgary, Alberta  
Canada T2E 6R7

*Number:* SH02-26

*Issue No.:* 2

*Approval Date:* July 26, 2002

*Issue Date:* April 26, 2004

**Responsible Office:**

Prairie and Northern

**Aircraft/Engine Type or Model:**

AEROSPATIALE AS 350B, AS 355 E,  
HUGHES 500N,  
MCDONNELL DOUGLAS HC 369D, 369E

**Canadian Type Certificate or Equivalent:**

AEROSPATIALE AS 350B H-83  
AEROSPATIALE AS 355 E H-87  
HUGHES 500N H-95  
MCDONNELL DOUGLAS HC 369D H3WE  
MCDONNELL DOUGLAS HC 369E H3WE

**Description of Type Design Change:**

DynaNav Seisbag System Installation

**Required Equipment and Limitations:**

Aerospatiale AS 350/AS 355:

Installation of DynaNav Seisbag System to be in accordance with Transport Canada approved, AERO Design Ltd. Document Control List DCL444, Revision 1 or later approved revision.

Basis of Certification for installation is FAR 27, amendment 27-16.

McDonnell Douglas (Hughes) 369 D/E, 500N:

Installation of DynaNav Seisbag System to be in accordance with Transport Canada approved, AERO Design Ltd. Document Control List DCL598-1, Revision 1 or later approved revision.

Utility Power Provisions installed in accordance with drawing 59809 may remain installed if the DynaNav Seisbag System is removed.

Basis of Certification for installation is CAR 6, amendment 6-5.

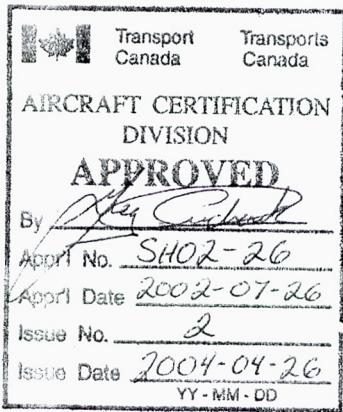
-- END --

**Conditions:** This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated **will not** adversely affect the airworthiness of the modified product.



Greg Oucharek  
For Minister of Transport

# DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
<b>INSTALLATION DOCUMENTS</b>		
59801	Installation Overview	0
59802	DynaByte Computer Installation	2
59803	DynaViz Display Installation	0
59804	Antenna Installations	1
59805	Collective Box Installation	1
59806	Alternate Collective Box Installation	1
59807	Fire Extinguisher Relocation	0
59808	Alternate Fire Extinguisher Relocation	0
59809	Utility Power Provisions Installation	0
59880	Wiring Diagram	0
<b>FABRICATION DOCUMENTS</b>		
59810	Collective Switch Box Assembly	0
59820	Frame Assembly	2
59821	Hinge Assembly	1
59822	Bracket Fabrication	1
59823	Collective Switch Box Fabrication	1
59824	Guard Fabrication	1
59825	Mounting Plate	1
<b>ENGINEERING DOCUMENTS</b>		
ER598.01	Engineering Report – Seisbag System	0
ER598.02	Engineering Report – Fire Extinguisher Relocation	0
TR560.02	EMI/RMI Test Report	0
ER591.01	Engineering Report – Utility Power Provisions	0
<b>APPROVAL:</b>		
 <p>Transport Canada / Transports Canada AIRCRAFT CERTIFICATION DIVISION <b>APPROVED</b> By: <i>[Signature]</i> Appt No. <u>SH02-26</u> Appt Date <u>2002-07-26</u> Issue No. <u>2</u> Issue Date <u>2004-04-26</u> YY-MM-DD</p>	ORIGINAL DATE: 12 February, 2004	<b>AERO DESIGN LTD.</b> 2013 – 39 <sup>th</sup> Ave NE Calgary, Alberta T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333
	REVISION DATE: 21 April, 2004	
	SHEET 1 OF 1	<b>MD Helicopters (Hughes)</b> <b>369D/E, 500N</b> <b>Seisbag System Installation</b>
DCL598-1		Rev.  <span style="font-size: 2em; font-weight: bold;">1</span>



Transport  
Canada

Transports  
Canada

**Prairie and Northern Region - Aircraft Certification - RACD**  
**800-1601 Airport Rd NE**  
**Calgary, Alberta**  
**T2E 6Z8**

Your File      Votre référence

Our file      Notre référence

C-04-0250

DATE: April 26, 2004

AERO Design Ltd.  
2013 – 39 Avenue, N.E.  
Calgary AB  
T2E 6R7

**Subject:      STC Approval of DynaNav Seisbag System Installation, SH02-26 Issue 2**


Mr. Ted Burgoin,

This Supplemental Type Certificate (STC) is issued in response to the application made by AERO Design Ltd. to this office on February 17, 2004.

The transfer of these documents in the name of another person requires a prior approval from the Minister in accordance with Canadian Aviation Regulations (CAR) 513.25. Please also consult CAR 571.06(4) for additional guidance.

A Canadian STC holder is required to report any service problem experienced with their product. Therefore, should you become aware of any defect, malfunction, or failure resulting from this design change approval, it is your responsibility to submit a Service Difficulty Report to Transport Canada in accordance with CAR Part V, Subpart 91.

Thank you,



\_\_\_\_\_  
Greg Oucharek, P. Eng  
Senior Engineer, Aircraft Certification  
(403) 292-4990  
oucharg@tc.gc.ca



# AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

APPLICANT: AERO Design Ltd.  
2013 - 39th Ave N.E.  
Calgary, Alberta, T2E 6R7

DATE: 02 February, 2004  
REV. No. 1 17 February, 2004





CORRESPONDANCE TO: AERO Design Ltd.  
(If other than applicant) 2013 - 39th Ave N.E.  
Calgary, Alberta, T2E 6R7

MAKE: MD (Hughes)  
MODEL: 369D/E, 500N

REGISTRATION: All eligible  
SERIAL No.: All eligible

NATURE OF WORK: DynaNav System Installation

MODEL CERTIFICATION BASIS: CAR 6, dated December 20, 1956, including Amendments 6-1 through 6-5  
MODIFICATION CERTIFICATION BASIS: CAR 6, dated December 20, 1956, including Amendments 6-1 through 6-5

Airworthiness Requirement	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
<b>Subpart B</b>	<b>Flight</b>				
6.104	Empty Weight	Weight and Balance provided on installation drawings	X		
<b>Subpart C</b>	<b>Structure</b>				
6.200	Loads	Analysis/Load Test	X		
6.201	Strength and Deformation	Analysis/Load Test	X		
6.202	Proof of Structure	Analysis/Load Test	X		
6.212	Maneuvering Conditions	Analysis/Load Test	X		
6.260	Emergency Landing Conditions – General	Analysis/Load Test	X		
<b>Subpart D</b>	<b>Design and Construction</b>				
6.301	Materials	Specification on Drawings	X		
6.302	Fabrication Methods	Specification on Drawings	X		
6.303	Standard Fastenings	Specification on Drawings	X		
6.304	Protection	Specification on Drawings	X		
6.305	Inspection Provisions	Specification on Drawings	X		
6.306	Material Strength Properties	Use of MIL-HDBK-5	X		
6.307	Special Factors	Analysis	X		
<b>Subpart F</b>	<b>Equipment</b>				
6.601	Functional and Installational Requirements	Design/Specification on Drawings	X		
6.605(e)	Electrical Protective Devices	Specification on Drawings	X		
6.620	Installation	Design/Statement in Report	X		
6.625	Protective Devices	Specification on Drawings	X		MS Circuit breaker specified

AIRWORTHINESS REQUIREMENTS  
COMPLIANCE PROGRAM

Airworthiness Requirement	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
6.626 6.627	Protective Devices Installation Electric Cables	Specification on Drawings Analysis	X X	} }	
<b>Subpart G</b> 6.730	<b>Operating Limitations and Information</b> Markings and Placards – General	Specifications on Drawings	X		Components, plugs and switches identified

AERO DESIGN LTD.

2013 - 39 Avenue N.E., Calgary, Alberta, T2E 6R7

Tel: 403-250-8027

Fax: 403-250-8333

aerodesign@telusplanet.net

26 April, 2004

Transport Canada  
Aircraft Certification Division  
800-1601 Airport Road  
Calgary, Alberta  
T2E 6Z8

Attn: Greg Oucharek

Your File : SH02-26

Our File : 598

Re: MD 369 DynaNav

Greg,

Please find attached the following documents related to this project:

Document Control List	DCL598-1	Revision 1
Drawings		
DynaByte Computer Installation	59802	Revision 2
Antenna Installations	59804	Revision 1
Collective Box Installation	59805	Revision 1
Alternate Collective Box Installation	59806	Revision 1
Frame Assembly	59820	Revision 2
Hinge Assembly	59821	Revision 1
Bracket Fabrication	59822	Revision 1
Collective Switch Box Fabrication	59823	Revision 1
Guard Fabrication	59824	Revision 1
Mounting Plate	59825	Revision 1

The drawings have been revised to include Primer in the finish notes, part marking, and EMI/RMI testing in accordance with AC43.13-1B, Paragraph 11-107.

Regards,



Jeff Clarke, Technologist

Encl.

# DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
<b>INSTALLATION DOCUMENTS</b>		
59801	Installation Overview	0
59802	DynaByte Computer Installation	2
59803	DynaViz Display Installation	0
59804	Antenna Installations	1
59805	Collective Box Installation	1
59806	Alternate Collective Box Installation	1
59807	Fire Extinguisher Relocation	0
59808	Alternate Fire Extinguisher Relocation	0
59809	Utility Power Provisions Installation	0
59880	Wiring Diagram	0
<b>FABRICATION DOCUMENTS</b>		
59810	Collective Switch Box Assembly	0
59820	Frame Assembly	2
59821	Hinge Assembly	1
59822	Bracket Fabrication	1
59823	Collective Switch Box Fabrication	1
59824	Guard Fabrication	1
59825	Mounting Plate	1
<b>ENGINEERING DOCUMENTS</b>		
ER598.01	Engineering Report – Seisbag System	0
ER598.02	Engineering Report – Fire Extinguisher Relocation	0
TR560.02	EMI/RMI Test Report	0
ER591.01	Engineering Report – Utility Power Provisions	0
APPROVAL:	ORIGINAL DATE: 12 February, 2004	<b>AERO DESIGN LTD.</b> 2013 – 39 <sup>th</sup> Ave NE Calgary, Alberta T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333
	REVISION DATE: 21 April, 2004	
	SHEET 1 OF 1	<b>MD Helicopters (Hughes)</b> <b>369D/E, 500N</b> <b>Seisbag System Installation</b>
	<b>DCL598-1</b>	Rev. <b>1</b>



# FORM AE-100

DEPARTMENT OF TRANSPORT STATEMENT OF COMPLIANCE OF AIRCRAFT OR AIRCRAFT COMPONENTS WITH THE AIRWORTHINESS REQUIREMENTS		AE-100 No.: AE598-1 Initial Issue Date: 17 February, 2004  Revision: 1 Revision Date: 26 April, 2004  Approval No.: SH02-26  Delegation No.: 290M Delegate Name: E. Burgoin Classification of Designee: Employer: AERO Design Ltd.
Aircraft Mfr: MD (Hughes) Aircraft Model: 369D/E, 500N Registration:	Model Type Airplane <input type="checkbox"/> Helicopter <input checked="" type="checkbox"/> Appliance <input type="checkbox"/> Component <input type="checkbox"/>	

## LIST OF APPROVED REPORTS AND DATA


Document Number	Document Title	Compliance Status
DCL598-1	Revision 1 Document Control List and all documents referred to therein	
59802	Revision 2 DynaByte Computer Installation	
59804	Revision 1 Antenna Installations	
59805	Revision 1 Collective Box Installation	
59806	Revision 1 Alternate Collective Box Installation	
59820	Revision 2 Frame Assembly	
59821	Revision 1 Hinge Assembly	
59822	Revision 1 Bracket Fabrication	
59823	Revision 1 Collective Switch Box Fabrication	
59824	Revision 1 Guard Fabrication	
59825	Revision 1 Mounting Plate	
DATA APPROVED BY TRANSPORT CANADA		

## CERTIFICATION

UNDER THE AUTHORITY VESTED IN ME BY THE DEPARTMENT OF TRANSPORT, I HEREBY CERTIFY THAT THE DATA LISTED ABOVE AND ON THE ATTACHED SHEETS NUMBERED Nil HAVE BEEN EXAMINED IN ACCORDANCE WITH ESTABLISHED PROCEDURES AND FOUND TO COMPLY, TO THE BEST OF MY KNOWLEDGE AND BELIEF WITH THE PERTINENT COMPLIANCE REQUIREMENTS.

I THEREFORE ☒ RECOMMEND FOR APPROVAL OF THESE DATA

☐ APPROVE THESE DATA

  
E. Burgoin, DAR 290M



**E. Burgoin**

---

**From:** "Oucharek, Gregory" <OUCHARG@tc.gc.ca>  
**To:** "E. Burgoin (E-mail)" <ted.aerodesign@telusplanet.net>  
**Sent:** Tuesday, April 06, 2004 8:55 AM  
**Subject:** SH02-26 Drawing Change Notice

Ted,

I have completed the review for Issue 2 and request the following be addressed ...

Upon review of Issue 1 records, fabrication drawings were requested to include Primer in the finish notes and Part Marking on the details. These additions were made for Issue 1 but not carried over with Issue 2 fabrication drawings.

We also discussed updating your standard note for interference checking to specify in accordance with AC43.13-1B, Paragraph 11-107. You had proposed a DCN to accomodate this change. This would also be acceptable to capture the finish and part marking requested initially.

Do you concur?

Please advise.

Greg

PRIMER  
 ADDED PART MARKING TO 598 20/21/22/23/24/25  
 ADDED AC43.13-1B Para 11-107 TO 598 02

Plot DWGS.

ORDER AN 6-12A BOLTS API ✓

## Aero Design

---

**From:** "Oucharek, Gregory" <OUCHARG@tc.gc.ca>  
**To:** "Jeff Clarke (E-mail)" <jeff.aerodesign@telusplanet.net>  
**Sent:** Friday, April 02, 2004 1:13 PM  
**Subject:** MD 500 Fire Extinguisher Relocation - SH02-26

Jeff,

In reviewing ER598.02, I understand that certification to CAR 6 for relocating the fire extinguisher is not required. However, the associated operational requirement CAR 602.60(1)(c)(iii) states that the fire extinguisher must be "readily available in flight to each crew member".

Can you describe how this requirement was assessed, ie measurements, ground check etc., for left side operation and right side installation?

Thanks,

> Greg Oucharek, P. Eng  
> Senior Engineer, Aircraft Certification  
> Prairie & Northern Region,  
> Calgary, Alberta  
> (403) 292-4990  
>

Checked on MD 500N, Bell 206B, DHC-6, KING AIR  
FOR ACCESSIBILITY OF FIRE EXTINGUISHER.

LOCATION IS WITHIN REACH OF PILOT.

**Requirements for Power-driven Aircraft**

**602.60 (1)** No person shall conduct a take-off in a power-driven aircraft, other than an ultra-light aeroplane, unless the following operational and emergency equipment is carried on board:

- (a)* a checklist or placards that enable the aircraft to be operated in accordance with the limitations specified in the aircraft flight manual, aircraft operating manual, pilot operating handbook or any equivalent document provided by the manufacturer;
- (b)* where the aircraft is operated in VFR OTT, night VFR flight or IFR flight, all of the necessary current aeronautical charts and publications covering the route of the proposed flight and any probable diversionary route;
- (c)* a hand-held fire extinguisher in the cockpit that is
  - (i)* of a type suitable for extinguishing the fires that are likely to occur,
  - (ii)* designed to minimize the hazard of toxic gas concentrations, and
  - (iii)* readily available in flight to each flight crew member;
- (d)* a timepiece that is readily available to each flight crew member;
- (e)* where the aircraft is operated at night, a flashlight that is readily available to each crew member; and
- (f)* a first aid kit.

# MODIFICATION APPROVAL REQUEST APPLICATION FORM

MOD598-1, Rev. 0

<b>1. NAME AND ADDRESS OF APPLICANT:</b> AERO Design Ltd. 2013 39th Ave NE Calgary, AB, T2E 6R7		<b>2. IDENTIFICATION OF PRODUCT</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">MAKE: McDonnell Douglas (Hughes)</td> <td style="width: 50%;">MODEL: 369D, 369E, 500N</td> </tr> <tr> <td>SERIAL No.: All Eligible</td> <td>REGISTRATION: All Eligible</td> </tr> </table>		MAKE: McDonnell Douglas (Hughes)	MODEL: 369D, 369E, 500N	SERIAL No.: All Eligible	REGISTRATION: All Eligible																																																																																										
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PER: SIGNATURE OF APPLICANT		Consultant _____ TITLE _____																																																																																															
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<b>Current Information, directly from the Official Canadian Civil Aircraft Register database.</b>
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<i>Mark</i>	C-GSHT	<i>Serial No</i>	911083D
<i>Common Name</i>	Hughes	<i>Model</i>	369D
<i>Base Of Op. - Country</i>	CANADA		
<i>Base Of Op. - Province</i>	Northwest Territories		
<i>Base Of Op. - Location</i>	Yellowknife		
<i>File Location</i>	Edmonton	<i>Basis for Eligibility for Registration</i>	Type Certificate - H3WE
<i>Reg Purpose Category</i>	Commercial Helicopter	<i>Weight (Kgs)</i>	1361
<i>Manufacturer</i>	Hughes Helicopters Div.- Summa Corp.		
<i>Year of Manufacture</i>	1981	<i>Year Imported</i>	2000
<i>Country of Manufacture</i>	U.S.A.		

**Owner Registration**

<i>Owner Registered Since</i>	2001-11-27	<i>Last Certificate of Registration Issued</i>	2001-11-27
<i>Engine</i>	Turbo Shaft	<i>Number of Engines</i>	1

**Owner Information**

<i>Name ( 1 of 4 )</i>	Great Slave Helicopters Ltd	<i>Mail Recipient</i>	Yes
<i>Address</i>	Bag 7500		
<i>City</i>	Yellowknife	<i>Province</i>	Northwest Territories
<i>Postal Code</i>	X1A 2R3	<i>Region</i>	Prairie and Northern
<i>Name ( 2 of 4 )</i>	3542564 Canada Inc.	<i>Mail Recipient</i>	No
<i>Trade Name Used</i>	Sahtu Helicopters		
<i>Address</i>	#26 Yellowknife Airport		
<i>City</i>	Yellowknife	<i>Province</i>	Northwest Territories
<i>Postal Code</i>	X1A 3T2	<i>Region</i>	Prairie and Northern
<i>Name ( 3 of 4 )</i>	Denendeh Helicopters Ltd.	<i>Mail Recipient</i>	No
<i>Address</i>	#22 Yellowknife Airport		
<i>City</i>	Yellowknife	<i>Province</i>	Northwest Territories

<i>Postal Code</i>	X1A 3T2	<i>Region</i>	Prairie and Northern
<i>Name ( 4 of 4 )</i>	Hudson Bay Helicopters Ltd.	<i>Mail Recipient</i>	No
<i>Address</i>	Bag 7500		
<i>City</i>	Yellowknife	<i>Province</i>	Northwest Territories
<i>Postal Code</i>	X1A 2R3	<i>Region</i>	Prairie and Northern

**AERO DESIGN LTD.**

2013 - 39 Avenue N.E., Calgary, Alberta, T2E 6R7

Tel: 403-250-8027

Fax: 403-250-8333

aerodesign@telusplanet.net

16 March, 2004

Great Slave Helicopters Ltd.

Bag 7500

Yellowknife, NWT

X1A 2R3

Attn: Dwight Webb

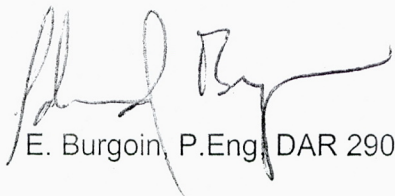
Re: MD 369D DynaNav Installation

Please find attached the following documents related to this project:

Limited Supplemental Type Certificate

C-LSH01-132/D Issue 4

Regards,



E. Burgoin, P.Eng. DAR 290M

Encl.

ATTN: TODD JOHNSON

**AERO DESIGN LTD.**

2013 – 39 Avenue N.E., Calgary, Alberta, T2E 6R7

Tel: 403-250-8027

Fax: 403-250-8333

aerodesign@telusplanet.net

16 March, 2004

Transport Canada  
Aircraft Certification Division  
800-1601 Airport Road  
Calgary, Alberta  
T2E 6Z8

Attn: Greg Oucharek

Your File : C-01-1213

Our File : 598

Re: MD 369D DynaNav

Greg,

Please find attached the following documents related to this project:

Limited Supplemental Type Certificate  
Modification Approval Request Form

C-LSH01-132/D Issue 4  
MOD598 Rev. 1

Revision is to add registration C-GSHT.

Regards,



E. Burgoin, P.Eng, DAR/290M

Encl.





Department of Transport

## Limited Supplemental Type Certificate

**This approval issued to:**

AERO Design Ltd.  
2013 - 39th Avenue NE  
Calgary, Alberta  
T2E 6R7

**Approval Number:** C-LSH01-132/D

**Issue Number.:** 4

**Date of Approval:** 13 August, 2001

**Date of Issue:** 16 March, 2004

**Responsible Office:** Prairie and Northern

**Aircraft / Engine Type:** Eurocopter  
McDonnell Douglas (Hughes)

**Model:** AS350 BA, B-1, B-2  
369D

**Registration:** See continuation sheet

**Serial No.:** See continuation sheet

**Canadian Type Certificate or Equivalent:** H-83

**Description of Design Change:** Dynaflight Seisbag System Installation

**Required Equipment and Limitations:** Eurocopter AS350:  
Installation of DynaFlight Seisbag System to be completed in accordance with Transport Canada approved, AERO Design Ltd. Document Control List, DCL458, Rev. 0, dated 13 August, 2001 or later approved revision.

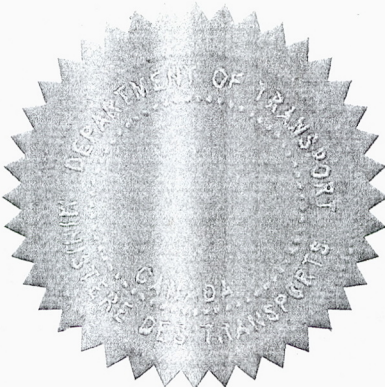
Basis of Certification for installation is FAR 27, at amendment 27-10.

McDonnell Douglas (Hughes) 369:  
Installation of DynaFlight Seisbag System to be completed in accordance with Transport Canada approved, AERO Design Ltd. Document Control List, DCL598, Rev. 0, dated 6 February, 2004 or later approved revision.

Utility Power Provisions installed in accordance with drawing 59809 may remain installed if the DynaFlight Seisbag System is removed.

Basis of Certification for installation is CAR 6 at amendment 6-4.

Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the modified product.



E. Burgoin, DAR 290M

**For the Minister of Transport**

## Continuation Sheet

Approval Number: C-LSH01-132/D

Issue Number: 4

Date of Approval: 13 August, 2001

Date of Issue: 16 March, 2004

Approval Data (Continued):

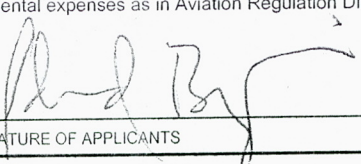
NOTE: THIS ADDENDUM SHALL REMAIN PART OF THE CERTIFICATE REFERRED TO THEREIN.

MODEL	REGISTRATION	SERIAL
EUROCOPTER		
AS350 BA	C-GIUX	1240
AS350 BA	C-GRTL	1377
AS350 BA	C-GRTM	1402
AS350 BA	C-FHAF	1543
AS350 B-1	C-GGSP	2126
AS350 B-1	C-GFHN	2128
AS350 BA	C-GHMZ	2325
AS350 B-2	C-GGSW	2675
AS350 B-2	C-FGSC	3067
AS350 B-2	C-GGSY	3591
MCDONNELL DOUGLAS (HUGHES)		
369D	C-GTNM	490485D
369D	C-GSHT	911083D




MODIFICATION APPROVAL REQUEST APPLICATION FORM

MOD598, Rev. 1

1. NAME AND ADDRESS OF APPLICANT:  AERO Design Ltd. 2013 39th Ave NE Calgary, AB, T2E 6R7		2. IDENTIFICATION OF PRODUCT				
		MAKE:  MD Helicopters		MODEL:  369D		
ALL CORRESPONDANCE TO: AERO Design Ltd. 2013 39th Ave N.E. Calgary, AB T2E 6R7		SERIAL No.:  911083D		REGISTRATION:  C-GSHT		
3. REQUEST FOR:						
A. SUPPLEMENTAL TYPE CERTIFICATE (STC)		<input type="checkbox"/>				
B. STC/STA REVISION		<input type="checkbox"/> STC/STA No.				
C. LIMITED SUPPLEMENTAL TYPE CERTIFICATE (LSTC)		<input type="checkbox"/>				
D. LIMITED STC/STA REVISION		<input checked="" type="checkbox"/> LSTC/LSTA No. C-LSH01-132/D				
E. F.A.A. SUPPLEMENTAL TYPE CERTIFICATE		<input type="checkbox"/>				
F. F.A.A. STC REVISION		<input type="checkbox"/> STC No.				
G. FAMILIARIZATION OF F.A.A. STC		<input type="checkbox"/> STC No.				
H. REPAIR DESIGN APPROVAL (RDC)		<input type="checkbox"/>				
I. PARTS DESIGN APPROVAL (PDA)		<input type="checkbox"/>				
4. TITLE OF MODIFICATION OR REPAIR: DynaFlight Seisbag System Installation						
5. BRIEF DESCRIPTION OF MODIFICATION OR REPAIR: Installation of computer and GPS based system for pre-programming locations for dropping seismic equipment and recording actual drop locations.						
6. APPLICABLE TYPE APPROVAL (TA) OR TYPE CERTIFICATE (TC) DOCUMENTS:						
A. TA NO. _____ B. TC No. H3WE C. OTHER _____						
7. PROPOSED BASIS OF APPROVAL:						
A. SAME AS TA <input type="checkbox"/> B. SAME AS TC <input checked="" type="checkbox"/> C. OTHER <input type="checkbox"/> (Please specify) _____						
8. DOCUMENTATION CHECKLIST		REQUIRED		FOR DOT USE ONLY		
				RECEIVED		
		YES	NO	YES	NO	DATE
COMPLIANCE PROGRAM		X				
MASTER DRAWING LIST		X				
FLIGHT MANUAL SUPPLEMENT			X			
MAINTENANCE MANUAL SUPPLEMENT			X			
INSTRUCTIONS FOR CONTINUING AIRWORTHINESS			X			
ENGINEERING REPORTS		X				
DESIGN DRAWINGS			X			
MANUFACTURE DRAWINGS & INSTALLATION INSTRUCTIONS		X				
ELECTRICAL LOAD ANALYSIS			X			
DRAFT STC, LSTC OR RDA			X			
WEIGHT AND MOMENT CHANGE		X				
FLIGHT TEST DATA			X			
OTHER (Specify)						
9. APPLICANT'S REMARKS: Revision is to add eligible registration						
10. In addition to the payment of Aircraft Certification approval fees as prescribed in Canadian Aviation Regulations (CAR) Section 104, I agree to reimburse Transport Canada incremental expenses as in Aviation Regulation Directive No. 3, or equivalent, as applicable. For further details governing cost recovery, refer to AMA 513/4.						
PER: 		Consultant		16 March, 2004		
SIGNATURE OF APPLICANTS		TITLE		DATE		
11.						
SIGNATURE OF REGIONAL ENGINEER		DATE				

# FORM AE-100

DEPARTMENT OF TRANSPORT STATEMENT OF COMPLIANCE OF AIRCRAFT OR AIRCRAFT COMPONENTS WITH THE AIRWORTHINESS REQUIREMENTS		AE-100 No.: AE598-1 Initial Issue Date: 17 February, 2004  Revision: 0 Revision Date:  Approval No.: SH02-26  Delegation No.: 290M Delegate Name: E. Burgoin Classification of Designee: Employer: AERO Design Ltd.	
Aircraft Mfr: MD (Hughes) Aircraft Model: 369D/E, 500N Registration:		Model Type Airplane <input type="checkbox"/> Helicopter <input checked="" type="checkbox"/> Appliance <input type="checkbox"/> Component <input type="checkbox"/>	
LIST OF APPROVED REPORTS AND DATA			
Document Number	Document Title		Compliance Status
DCL598-1	Revision 0	Document Control List and all documents referred to therein	
ER598.01	Revision 0	Engineering Report	
ER598.02	Revision 0	Engineering Report	
TR560.02	Revision 0	EMI/RMI Test Report	
ER591.01	Revision 0	Engineering Report	
59801	Revision 0	Installation Overview	
59802	Revision 1	DynaByte Computer Installation	
59803	Revision 0	DynaViz Display Installation	
59804	Revision 0	Antenna Installations	
59805	Revision 0	Collective Box Installation	
59806	Revision 0	Alternate Collective Box Installation	
59807	Revision 0	Fire Extinguisher Relocation	
59808	Revision 0	Alternate Fire Extinguisher Relocation	
59809	Revision 0	Utility Power Provisions Installation	
59810	Revision 0	Collective Switch Box Assembly	
59820	Revision 1	Frame Assembly	
59821	Revision 0	Hinge Assembly	
59822	Revision 0	Bracket Fabrication	
59823	Revision 0	Collective Switch Box Fabrication	
59824	Revision 0	Guard Fabrication	
59825	Revision 0	Mounting Plate	
59880	Revision 0	Wiring Diagram	
DATA APPROVED BY TRANSPORT CANADA			
CERTIFICATION  UNDER THE AUTHORITY VESTED IN ME BY THE DEPARTMENT OF TRANSPORT, I HEREBY CERTIFY THAT THE DATA LISTED ABOVE AND ON THE ATTACHED SHEETS NUMBERED Nil HAVE BEEN EXAMINED IN ACCORDANCE WITH ESTABLISHED PROCEDURES AND FOUND TO COMPLY, TO THE BEST OF MY KNOWLEDGE AND BELIEF WITH THE PERTINENT COMPLIANCE REQUIREMENTS.			
I THEREFORE <input checked="" type="checkbox"/> RECOMMEND FOR APPROVAL OF THESE DATA <input type="checkbox"/> APPROVE THESE DATA			
 E. Burgoin, DAR 290M			



# DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
<b>INSTALLATION DOCUMENTS</b>		
59801	Installation Overview	0
59802	DynaByte Computer Installation	1
59803	DynaViz Display Installation	0
59804	Antenna Installations	0
59805	Collective Box Installation	0
59806	Alternate Collective Box Installation	0
59807	Fire Extinguisher Relocation	0
59808	Alternate Fire Extinguisher Relocation	0
59809	Utility Power Provisions Installation	0
59880	Wiring Diagram	0
<b>FABRICATION DOCUMENTS</b>		
59810	Collective Switch Box Assembly	0
59820	Frame Assembly	1
59821	Hinge Assembly	0
59822	Bracket Fabrication	0
59823	Collective Switch Box Fabrication	0
59824	Guard Fabrication	0
59825	Mounting Plate	0
<b>ENGINEERING DOCUMENTS</b>		
ER598.01	Engineering Report – Seisbag System	0
ER598.02	Engineering Report – Fire Extinguisher Relocation	0
TR560.02	EMI/RMI Test Report	0
ER591.01	Engineering Report – Utility Power Provisions	0
APPROVAL:	ORIGINAL DATE: 12 February, 2004  REVISION DATE:	<b>AERO DESIGN LTD.</b> 2013 – 39 <sup>th</sup> Ave NE Calgary, Alberta T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333
	SHEET 1 OF 1	<b>MD Helicopters (Hughes) 369D/E, 500N Seisbag System Installation</b>
	<b>DCL598-1</b>	Rev. <b>0</b>

# AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

APPLICANT: AERO Design Ltd.  
2013 - 39th Ave N.E.  
Calgary, Alberta, T2E 6R7

DATE: 02 February, 2004  
REV. No. 1 17 February, 2004

CORRESPONDANCE TO: AERO Design Ltd.  
(If other than applicant) 2013 - 39th Ave N.E.  
Calgary, Alberta, T2E 6R7

MAKE: MD (Hughes)  
MODEL: 369D/E, 500N

REGISTRATION: All eligible  
SERIAL No.: All eligible

NATURE OF WORK: DynaNav System Installation

MODEL CERTIFICATION BASIS: CAR 6, dated December 20, 1956, including Amendments 6-1 through 6-5  
MODIFICATION CERTIFICATION BASIS: CAR 6, dated December 20, 1956, including Amendments 6-1 through 6-5

Airworthiness Requirement	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
<b>Subpart B</b>	<b>Flight</b>				
6.104	Empty Weight	Weight and Balance provided on installation drawings	X		
<b>Subpart C</b>	<b>Structure</b>				
6.200	Loads	Analysis/Load Test	X		
6.201	Strength and Deformation	Analysis/Load Test	X		
6.202	Proof of Structure	Analysis/Load Test	X		
6.212	Maneuvering Conditions	Analysis/Load Test	X		
6.260	Emergency Landing Conditions – General	Analysis/Load Test	X		
<b>Subpart D</b>	<b>Design and Construction</b>				
6.301	Materials	Specification on Drawings	X		
6.302	Fabrication Methods	Specification on Drawings	X		
6.303	Standard Fastenings	Specification on Drawings	X		
6.304	Protection	Specification on Drawings	X		
6.305	Inspection Provisions	Specification on Drawings	X		
6.306	Material Strength Properties	Use of MIL-HDBK-5	X		
6.307	Special Factors	Analysis	X		
<b>Subpart F</b>	<b>Equipment</b>				
6.601	Functional and Installational Requirements	Design/Specification on Drawings	X		
6.605(e)	Electrical Protective Devices	Specification on Drawings	X		MS Circuit breaker specified
6.620	Installation	Design/Statement in Report	X		
6.625	Protective Devices	Specification on Drawings	X		

AIRWORTHINESS REQUIREMENTS  
COMPLIANCE PROGRAM

Airworthiness Requirement	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
6.626	Protective Devices Installation	Specification on Drawings	X		
6.627	Electric Cables	Analysis	X		
<b>Subpart G</b>	<b>Operating Limitations and Information</b>				
6.730	Markings and Placards – General	Specifications on Drawings	X		Components, plugs and switches identified

**Title:** Dyna-Nav Installation  
**Approval:** STC  
**Customer:** AERO Design Ltd.  
**Type and Model:** McDonnell Douglas (Hughes) 369D/E, 500N

**Definition Of Change:**

Description:

The Dyna-Nav System is installed in AS350 Helicopters under various LSTC's and STC SH02-26.

The system consists of a data processor computer weighing approx. 15 lb. to be secured in the aft cabin, under the passenger seats, a display mounted in the pilot compartment, a GPS antenna, and a telemetry antenna.

This scope of this project is to provide a Dyna-Nav installation in the Hughes 369D/E and 500N, included on STC SH02-26.

Primary Changes to the Aeronautical Product:

Installation of computer under passenger seat in aft compartment, installation of display in pilot compartment, GPS antenna installation, telemetry antenna installation.

Secondary Changes to the Aeronautical Product (Required as consequence of primary changes):

Relocation of fire extinguisher to accommodate display.

Other Relevant Modifications to the Aeronautical Product (Which impact on this change):



**Substantial Change Evaluation:**

The scope of this change is not substantial.

**Significant Change Evaluation:**

Refer to AMA 500/16, Appendix A, Tables A.2.1 through A.5.6, as applicable.

- Yes ☐ No ☒ The change is an example on the table of Significant Changes.  
Yes ☐ No ☒ The change is close to an example on the table of Significant Changes.  
Yes ☐ No ☒ The change is an example on the table of Not-Significant Changes.  
Yes ☐ No ☒ The change is close to an example on the table of Not-Significant Changes.  
Yes ☒ No ☐ The change is not an example on the tables.

- A. Is the general configuration changed? Yes ☐ No ☒  
A change to the general configuration at the product level that is likely to require a new model designation because of the need to distinguish the different product with other product models (eg. performance, interchangeability of major components etc).

Comments:

- B. Are the principles of construction changed? Yes ☐ No ☒  
A change at the product level to the materials and/or construction methods that affects the overall product's operating characteristics or inherent strength.

Comments:

- C. Have the assumptions used for certification been invalidated? Yes ☐ No ☒  
Changes to product level assumptions, either design or engineering, associated with product development, compliance demonstration, performance or operating envelope that by themselves are so different, that the original assumptions are invalidated and the existing substantiation cannot be extrapolated to cover the changed product.

Comments:

**AERO DESIGN LTD.**

2013 - 39 Avenue N.E., Calgary, Alberta, T2E 6R7

Tel: 403-250-8027

Fax: 403-250-8333

aerodesign@telusplanet.net

17 February, 2004

Transport Canada  
Aircraft Certification Division  
800-1601 Airport Road  
Calgary, Alberta  
T2E 6Z8

Attn: Greg Oucharek

Your File : C-01-1213

Our File : 598

Re: MD 369 DynaNav

Greg,

Please find attached the following documents related to this project:

Draft Supplemental Type Certificate	SH02-26	Issue 2
Modification Approval Request Form	MOD598-1	Rev. 0
Compliance Program	CP598	Rev. 1
Project Summary	PS598-1	Rev. 0
AE 100 Form	AE598-1	Rev. 0
Document Control List	DCL598-1	Rev. 0
Engineering Report	ER598.01	Rev. 0
Engineering Report	ER598.02	Rev. 0
Engineering Report	ER591.01	Rev. 0
Test Report	TR560.02	Rev. 0
Drawings		
Installation Overview	59801	Rev. 0
DynaByte Installation	59802	Rev. 0
DynaViz Installation	59803	Rev. 0
Antenna Installations	59804	Rev. 0
Collective Switch Box Installation	59805	Rev. 0
Alternate Collective Switch Box Installation	59806	Rev. 0
Fire Extinguisher Relocation	59807	Rev. 0
Alternate Fire Extinguisher Relocation	59808	Rev. 0
Utility Power Provisions	59809	Rev. 0
Collective Switch Box Assembly	59810	Rev. 0
Frame Assembly	59820	Rev. 0
Hinge Assembly	59821	Rev. 0
Bracket Assembly	59822	Rev. 0
Collective Switch Box Fabrication	59823	Rev. 0
Guard Fabrication	59824	Rev. 0
Mounting Plate	29825	Rev. 0
Wiring Diagram	59880	Rev. 0

Regards,

  
E. Burgoin, P.Eng, DAR 290M

Encl.

DELIVERED BY HAND  
17 FEB 2004

TO DENNIS HOEPNER  
ADVISED 1 WEEK TURN AROUND REQ'D

**Basis of Certification of the Basic Aeronautical Product:**

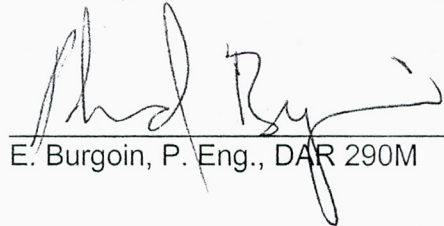
MD 500N, Type Certificate Data Sheet H-95

CAR 6, dated December 20, 1956, including Amendments 6-1 through 6-5, and Special Condition, "Conditions Establishing Compensating Factors Providing an Equivalent Level of Safety Under Civil Air Regulations, Section 6.10, for Light Turbine Powered Helicopters," dated October 2, 1962, as revised February 8, 1966. In addition, height velocity testing is required to 7000 feet, in accordance with paragraphs 6.111 and 6.116, as amended by Amendment 6-7, issued October 8, 1963.

**Basis of Certification for the Change to the Aeronautical Product:**

Same as the original basis of certification for 500N on the Type Certificate Data Sheet.

Under the authority vested in me by the Minister, I have examined the change in type design listed above according to the established procedures and hereby determine that it is not significant pursuant to subsection 511.13(3) or 513.07(3) of the CARS, to the best of my knowledge and belief.



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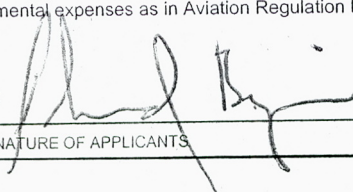
E. Burgoin, P. Eng., DAR 290M

17 February, 2004  
Date



MODIFICATION APPROVAL REQUEST APPLICATION FORM

MOD598-1, Rev. 0

1. NAME AND ADDRESS OF APPLICANT: AERO Design Ltd. 2013 39th Ave NE Calgary, AB, T2E 6R7		2. IDENTIFICATION OF PRODUCT				
		MAKE: McDonnell Douglas (Hughes)	MODEL: 369D, 369E, 500N			
ALL CORRESPONDANCE TO: AERO Design Ltd. 2013 39th Ave N.E. Calgary, AB T2E 6R7		SERIAL No.: All Eligible	REGISTRATION: All Eligible			
3. REQUEST FOR:						
A. SUPPLEMENTAL TYPE CERTIFICATE (STC)		<input type="checkbox"/>				
B. STC/STA REVISION		<input checked="" type="checkbox"/>	STC/STA No. SH02-26			
C. LIMITED SUPPLEMENTAL TYPE CERTIFICATE (LSTC)		<input type="checkbox"/>				
D. LIMITED STC/STA REVISION		<input type="checkbox"/>	LSTC/LSTA No.			
E. F.A.A. SUPPLEMENTAL TYPE CERTIFICATE		<input type="checkbox"/>				
F. F.A.A. STC REVISION		<input type="checkbox"/>	STC No.			
G. FAMILIARIZATION OF F.A.A. STC		<input type="checkbox"/>	STC No.			
H. REPAIR DESIGN APPROVAL (RDC)		<input type="checkbox"/>				
I. PARTS DESIGN APPROVAL (PDA)		<input type="checkbox"/>				
4. TITLE OF MODIFICATION OR REPAIR: DynaNav Seisbag System Installation						
5. BRIEF DESCRIPTION OF MODIFICATION OR REPAIR: Installation of computer and GPS based system for pre-programming locations for dropping seismic equipment and recording actual drop locations.						
6. APPLICABLE TYPE APPROVAL (TA) OR TYPE CERTIFICATE (TC) DOCUMENTS:						
A. TA NO. _____ B. TC No. H3WE _____ C. OTHER _____						
7. PROPOSED BASIS OF APPROVAL:						
A. SAME AS TA <input type="checkbox"/> B. SAME AS TC <input checked="" type="checkbox"/> C. OTHER <input type="checkbox"/> (Please specify) _____						
8. DOCUMENTATION CHECKLIST		REQUIRED		FOR DOT USE ONLY		
				RECEIVED		
		YES	NO	YES	NO	DATE
COMPLIANCE PROGRAM		X				
MASTER DRAWING LIST		X				
FLIGHT MANUAL SUPPLEMENT			X			
MAINTENANCE MANUAL SUPPLEMENT			X			
INSTRUCTIONS FOR CONTINUING AIRWORTHINESS			X			
ENGINEERING REPORTS		X				
DESIGN DRAWINGS			X			
MANUFACTURE DRAWINGS & INSTALLATION INSTRUCTIONS		X				
ELECTRICAL LOAD ANALYSIS			X			
DRAFT STC, LSTC OR RDA			X			
WEIGHT AND MOMENT CHANGE		X				
FLIGHT TEST DATA			X			
OTHER (Specify)						
9. APPLICANT'S REMARKS:						
10. In addition to the payment of Aircraft Certification approval fees as prescribed in Canadian Aviation Regulations (CAR) Section 104, I agree to reimburse Transport Canada incremental expenses as in Aviation Regulation Directive No. 3, or equivalent, as applicable. For further details governing cost recovery, refer to AMA 513/4.						
PER: 		Consultant		17 February, 2004		
SIGNATURE OF APPLICANTS		TITLE		DATE		
11.						
SIGNATURE OF REGIONAL ENGINEER		DATE				

**AERO DESIGN LTD.**

2013 - 39 Avenue N.E., Calgary, Alberta, T2E 6R7

Tel: 403-250-8027  
Fax: 403-250-8333  
aerodesign@telusplanet.net

06 February, 2004

Transport Canada  
Aircraft Certification Division  
800-1601 Airport Road  
Calgary, Alberta  
T2E 6Z8

Attn: Greg Oucharek

Your File : C-01-1166

Our File : 598

Re: MD 369 DynaNav

Greg,

Please find attached the following documents related to this project:

Limited Supplemental Type Certificate	C-LSH01-132/D	Issue 3
Modification Approval Request Form	MOD598	Rev. 0
Compliance Program	CP598	Rev. 0
Project Summary	PS598	Rev. 0
AE 100 Form	AE598	Rev. 0
Document Control List	DCI.598	Rev. 0
Engineering Report	ER598.01	Rev. 0
Engineering Report	ER598.02	Rev. 0
Engineering Report	ER591.01	Rev. 0
Test Report	TR560.02	Rev. 0
Drawings		
Installation Overview	59801	Rev. 0
DynaByte Installation	59802	Rev. 0
DynaViz Installation	59803	Rev. 0
Antenna Installations	59804	Rev. 0
Collective Switch Box Installation	59805	Rev. 0
Alternate Collective Switch Box Installation	59806	Rev. 0
Fire Extinguisher Relocation	59807	Rev. 0
Alternate Fire Extinguisher Relocation	59808	Rev. 0
Utility Power Provisions	59809	Rev. 0
Collective Switch Box Assembly	59810	Rev. 0
Frame Assembly	59820	Rev. 0
Hinge Assembly	59821	Rev. 0
Bracket Assembly	59822	Rev. 0
Collective Switch Box Fabrication	59823	Rev. 0
Guard Fabrication	59824	Rev. 0
Mounting Plate	29825	Rev. 0
Wiring Diagram	59880	Rev. 0



**AERO DESIGN LTD.**

2013 - 39 Avenue N.E., Calgary, Alberta, T2E 6R7

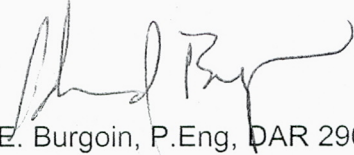
Tel: 403-250-8027

Fax: 403-250-8333

aerodesign@telusplanet.net

This installation was added to Great Slave Helicopters existing AS350 approval because it was needed quickly. If there is sufficient demand for this installation, the DynaNav STC will be revised to include the 369 with this installation.

Regards,

A handwritten signature in black ink, appearing to read 'E. Burgoin', written over the printed name.

E. Burgoin, P.Eng, DAR 290M

Encl.



Department of Transport

Limited Supplemental Type Certificate

This approval issued to:

AERO Design Ltd.  
2013 - 39th Avenue NE  
Calgary, Alberta  
T2E 6R7

Approval Number: C-LSH01-132/D

Issue Number.: 3

Date of Approval: 13 August, 2001

Date of Issue: 6 February, 2004

Responsible Office: Prairie and Northern

Aircraft / Engine Type: Eurocopter  
McDonnell Douglas (Hughes)

Model: AS350 BA, B-1, B-2  
369D

Registration: See continuation sheet

Serial No.: See continuation sheet

Canadian Type Certificate or Equivalent: H-83

Description of Design Change: Dynaflight Seisbag System Installation

Required Equipment and Limitations: Eurocopter AS350:  
Installation of DynaFlight Seisbag System to be completed in accordance with  
Transport Canada approved, AERO Design Ltd. Document Control List, DCL458, Rev.  
0, dated 13 August, 2001 or later approved revision.

Basis of Certification for installation is FAR 27, at amendment 27-10.

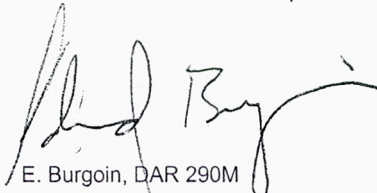
McDonnell Douglas (Hughes) 369:  
Installation of DynaFlight Seisbag System to be completed in accordance with  
Transport Canada approved, AERO Design Ltd. Document Control List, DCL598, Rev.  
0, dated 6 February, 2004 or later approved revision.

Utility Power Provisions installed in accordance with drawing 59809 may remain  
installed if the DynaFlight Seisbag System is removed.

Basis of Certification for installation is CAR 6 at amendment 6-4.

Conditions: This approval is only applicable to the type/model of aeronautical product  
specified therein. Prior to incorporating this modification, the installer shall establish  
that the interrelationship between this change and any other modification(s) incorp-  
orated will not adversely affect the airworthiness of the modified product.



  
E. Burgoin, DAR 290M

For the Minister of Transport

## Continuation Sheet

Approval Number: C-LSH01-132/D

Issue Number: 2

Date of Approval: 13 August, 2001

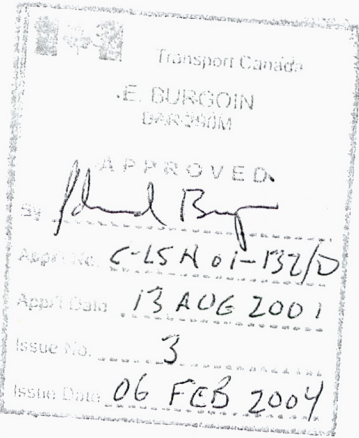
Date of Issue: 6 February, 2004

Approval Data (Continued):

NOTE: THIS ADDENDUM SHALL REMAIN PART OF THE CERTIFICATE REFERRED TO THEREIN.

MODEL	REGISTRATION	SERIAL
EUROCOPTER		
AS350 BA	C-GIUX	1240
AS350 BA	C-GRTL	1377
AS350 BA	C-GRTM	1402
AS350 BA	C-FHAF	1543
AS350 B-1	C-GGSP	2126
AS350 B-1	C-GFHN	2128
AS350 BA	C-GHMZ	2325
AS350 B-2	C-GGSW	2675
AS350 B-2	C-FGSC	3067
AS350 B-2	C-GGSY	3591
MCDONNELL DOUGLAS (HUGHES)		
369D	C-GTNM	490485D

# DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
59801	Installation Overview	0
59802	DynaByte Computer Installation	0
59803	DynaViz Display Installation	0
59804	Antenna Installations	0
59805	Collective Box Installation	0
59806	Alternate Collective Box Installation	0
59807	Fire Extinguisher Relocation	0
59808	Alternate Fire Extinguisher Relocation	0
59809	Utility Power Provisions Installation	0
59880	Wiring Diagram	0
FABRICATION DOCUMENTS		
59810	Collective Switch Box Assembly	0
59820	Frame Assembly	0
59821	Hinge Assembly	0
59822	Bracket Fabrication	0
59823	Collective Switch Box Fabrication	0
59824	Guard Fabrication	0
59825	Mounting Plate	0
ENGINEERING DOCUMENTS		
ER598.01	Engineering Report – Seisbag System	0
ER598.02	Engineering Report – Fire Extinguisher Relocation	0
TR560.02	EMI/RMI Test Report	0
ER591.01	Engineering Report – Utility Power Provisions	0
APPROVAL:  	ORIGINAL DATE: 06 February, 2004  REVISION DATE:	<b>AERO DESIGN LTD.</b> 2013 – 39 <sup>th</sup> Ave NE Calgary, Alberta T2E 6R7 Ph. (403) 250-8027 Fax. (403) 250-8333
	SHEET 1 OF 1	<b>MD Helicopters (Hughes)</b> <b>369D/E, 500N</b> <b>Seisbag System Installation</b>
	<b>DCL598</b>	
	Rev. <b>0</b>	



# AIRWORTHINESS REQUIREMENTS COMPLIANCE PROGRAM

APPLICANT: AERO Design Ltd.  
2013 - 39th Ave N.E.  
Calgary, Alberta, T2E 6R7

DATE: 02 February, 2004  
REV. No. 0

CORRESPONDANCE TO: AERO Design Ltd.  
(If other than applicant) 2013 - 39th Ave N.E.  
Calgary, Alberta, T2E 6R7

MAKE: MD (Hughes)  
MODEL: 369D

REGISTRATION: C-GTNM  
SERIAL No.: 490485D

NATURE OF WORK: DynaNav System Installation

MODEL CERTIFICATION BASIS: CAR 6, dated December 20, 1956, including Amendments 6-1 through 6-5  
MODIFICATION CERTIFICATION BASIS: CAR 6, dated December 20, 1956, including Amendments 6-1 through 6-5

Airworthiness Requirement	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
<b>Subpart B</b>	<b>Flight</b>				
6.104	Empty Weight	Weight and Balance provided on installation drawings		X	
<b>Subpart C</b>	<b>Structure</b>				
6.200	Loads	Analysis/Load Test		X	
6.201	Strength and Deformation	Analysis/Load Test		X	
6.202	Proof of Structure	Analysis/Load Test		X	
6.212	Maneuvering Conditions	Analysis/Load Test		X	
6.260	Emergency Landing Conditions – General	Analysis/Load Test		X	
<b>Subpart D</b>	<b>Design and Construction</b>				
6.301	Materials	Specification on Drawings		X	
6.302	Fabrication Methods	Specification on Drawings		X	
6.303	Standard Fastenings	Specification on Drawings		X	
6.304	Protection	Specification on Drawings		X	
6.305	Inspection Provisions	Specification on Drawings		X	
6.306	Material Strength Properties	Use of MIL-HDBK-5		X	
6.307	Special Factors	Analysis		X	
<b>Subpart F</b>	<b>Equipment</b>				
6.601	Functional and Installational Requirements	Design/Specification on Drawings		X	
6.605(e)	Electrical Protective Devices	Specification on Drawings		X	MS Circuit breaker specified
6.620	Installation	Design/Statement in Report		X	
6.625	Protective Devices	Specification on Drawings		X	

AIRWORTHINESS REQUIREMENTS  
COMPLIANCE PROGRAM

Airworthiness Requirement	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
6.626	Protective Devices Installation	Specification on Drawings		X	
6.627	Electric Cables	Analysis		X	
<b>Subpart G</b>	<b>Operating Limitations and Information</b>				
6.730	Markings and Placards – General	Specifications on Drawings		X	Components, plugs and switches identified

**Title:** Dyna-Nav Installation  
**Approval:** LSTC  
**Customer:** Great Slave Helicopters  
**Type and Model:** McDonnell Douglas (Hughes) 369D/E, 500N

**Definition Of Change:**

Description:

The Dyna-Nav System is installed in AS350 Helicopters under various LSTC's and STC SH02-26.

The system consists of a data processor computer weighing approx. 15 lb. to be secured in the aft cabin, under the passenger seats, a display mounted in the pilot compartment, a GPS antenna, and a telemetry antenna.

This scope of this project is to provide a Dyna-Nav installation in the Hughes 369D/E.

This approval could be extended to an STC if sufficient demand is demonstrated.

Primary Changes to the Aeronautical Product:

Installation of computer under passenger seat in aft compartment, installation of display in pilot compartment, GPS antenna installation, telemetry antenna installation.

Secondary Changes to the Aeronautical Product (Required as consequence of primary changes):

Relocation of fire extinguisher to accommodate display.

Other Relevant Modifications to the Aeronautical Product (Which impact on this change):

**Substantial Change Evaluation:**

The scope of this change is not substantial.

**Significant Change Evaluation:**

Refer to AMA 500/16, Appendix A, Tables A.2.1 through A.5.6, as applicable.

- Yes ☐ No ☒ The change is an example on the table of Significant Changes.  
Yes ☐ No ☒ The change is close to an example on the table of Significant Changes.  
Yes ☐ No ☒ The change is an example on the table of Not-Significant Changes.  
Yes ☐ No ☒ The change is close to an example on the table of Not-Significant Changes.  
Yes ☒ No ☐ The change is not an example on the tables.

- A. Is the general configuration changed? Yes ☐ No ☒  
A change to the general configuration at the product level that is likely to require a new model designation because of the need to distinguish the different product with other product models (eg. performance, interchangeability of major components etc).

Comments:

- B. Are the principles of construction changed? Yes ☐ No ☒  
A change at the product level to the materials and/or construction methods that affects the overall product's operating characteristics or inherent strength.

Comments:

- C. Have the assumptions used for certification been invalidated? Yes ☐ No ☒  
Changes to product level assumptions, either design or engineering, associated with product development, compliance demonstration, performance or operating envelope that by themselves are so different, that the original assumptions are invalidated and the existing substantiation cannot be extrapolated to cover the changed product.

Comments:



**Basis of Certification of the Basic Aeronautical Product:**

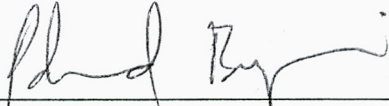
MD 500N, Type Certificate Data Sheet H-95

CAR 6, dated December 20, 1956, including Amendments 6-1 through 6-5, and Special Condition, "Conditions Establishing Compensating Factors Providing an Equivalent Level of Safety Under Civil Air Regulations, Section 6.10, for Light Turbine Powered Helicopters," dated October 2, 1962, as revised February 8, 1966. In addition, height velocity testing is required to 7000 feet, in accordance with paragraphs 6.111 and 6.116, as amended by Amendment 6-7, issued October 8, 1963.

**Basis of Certification for the Change to the Aeronautical Product:**


Same as the original basis of certification for 500N on the Type Certificate Data Sheet.

Under the authority vested in me by the Minister, I have examined the change in type design listed above according to the established procedures and hereby determine that it is not significant pursuant to subsection 511.13(3) or 513.07(3) of the CARS, to the best of my knowledge and belief.

  
\_\_\_\_\_  
E. Burgoin, P. Eng., DAR 290M

06 February, 2004  
Date

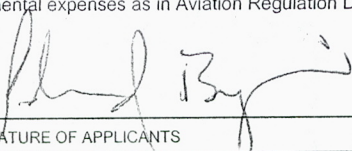
# FORM AE-100

DEPARTMENT OF TRANSPORT STATEMENT OF COMPLIANCE OF AIRCRAFT OR AIRCRAFT COMPONENTS WITH THE AIRWORTHINESS REQUIREMENTS		AE-100 No.: AE598 Initial Issue Date: 6 February, 2004  Revision: 0 Revision Date:  Approval No.: C-LSH01-132/D  Delegation No.: 290M Delegate Name: E. Burgoin Classification of Designee: Employer: AERO Design Ltd.	
Aircraft Mfr: MD (Hughes) Aircraft Model: 369D Registration: C-GTNM		Model Type Airplane <input type="checkbox"/> Helicopter <input checked="" type="checkbox"/> Appliance <input type="checkbox"/> Component <input type="checkbox"/>	
LIST OF APPROVED REPORTS AND DATA			
Document Number	Document Title		Compliance Status
DCL598	Revision 0	Document Control List and all documents referred to therein	
ER598.01	Revision 0	Engineering Report	
ER598.02	Revision 0	Engineering Report	
TR560.02	Revision 0	EMI/RMI Test Report	
ER591.01	Revision 0	Engineering Report	
59801	Revision 0	Installation Overview	
59802	Revision 0	DynaByte Computer Installation	
59803	Revision 0	DynaViz Display Installation	
59804	Revision 0	Antenna Installations	
59805	Revision 0	Collective Box Installation	
59806	Revision 0	Alternate Collective Box Installation	
59807	Revision 0	Fire Extinguisher Relocation	
59808	Revision 0	Alternate Fire Extinguisher Relocation	
59809	Revision 0	Utility Power Provisions Installation	
59810	Revision 0	Collective Switch Box Assembly	
59820	Revision 0	Frame Assembly	
59821	Revision 0	Hinge Assembly	
59822	Revision 0	Bracket Fabrication	
59823	Revision 0	Collective Switch Box Fabrication	
59824	Revision 0	Guard Fabrication	
59825	Revision 0	Mounting Plate	
59880	Revision 0	Wiring Diagram	
DATA APPROVED BY TRANSPORT CANADA			
CERTIFICATION  UNDER THE AUTHORITY VESTED IN ME BY THE DEPARTMENT OF TRANSPORT, I HEREBY CERTIFY THAT THE DATA LISTED ABOVE AND ON THE ATTACHED SHEETS NUMBERED Nil HAVE BEEN EXAMINED IN ACCORDANCE WITH ESTABLISHED PROCEDURES AND FOUND TO COMPLY, TO THE BEST OF MY KNOWLEDGE AND BELIEF WITH THE PERTINENT COMPLIANCE REQUIREMENTS.			
I THEREFORE <input type="checkbox"/> RECOMMEND FOR APPROVAL OF THESE DATA <input checked="" type="checkbox"/> APPROVE THESE DATA			
 E. Burgoin, DAR 290M			



MODIFICATION APPROVAL REQUEST APPLICATION FORM

MOD598, Rev. 0

1. NAME AND ADDRESS OF APPLICANT: AERO Design Ltd. 2013 39th Ave NE Calgary, AB, T2E 6R7		2. IDENTIFICATION OF PRODUCT				
		MAKE: MD Helicopters	MODEL: 369D			
ALL CORRESPONDANCE TO: AERO Design Ltd. 2013 39th Ave N.E. Calgary, AB T2E 6R7		SERIAL No.: 490485D	REGISTRATION: C-GTNM			
3. REQUEST FOR:						
A. SUPPLEMENTAL TYPE CERTIFICATE (STC)		<input type="checkbox"/>				
B. STC/STA REVISION		<input type="checkbox"/>	STC/STA No.			
C. LIMITED SUPPLEMENTAL TYPE CERTIFICATE (LSTC)		<input type="checkbox"/>				
D. LIMITED STC/STA REVISION		<input checked="" type="checkbox"/>	LSTC/LSTA No. C-LSH01-132/D			
E. F.A.A. SUPPLEMENTAL TYPE CERTIFICATE		<input type="checkbox"/>				
F. F.A.A. STC REVISION		<input type="checkbox"/>	STC No.			
G. FAMILIARIZATION OF F.A.A. STC		<input type="checkbox"/>	STC No.			
H. REPAIR DESIGN APPROVAL (RDC)		<input type="checkbox"/>				
I. PARTS DESIGN APPROVAL (PDA)		<input type="checkbox"/>				
4. TITLE OF MODIFICATION OR REPAIR: DynaFlight Seisbag System Installation						
5. BRIEF DESCRIPTION OF MODIFICATION OR REPAIR: Installation of computer and GPS based system for pre-programming locations for dropping seismic equipment and recording actual drop locations.						
6. APPLICABLE TYPE APPROVAL (TA) OR TYPE CERTIFICATE (TC) DOCUMENTS:						
A. TA NO. _____ B. TC No. H3WE _____ C. OTHER _____						
7. PROPOSED BASIS OF APPROVAL:						
A. SAME AS TA <input type="checkbox"/> B. SAME AS TC <input checked="" type="checkbox"/> C. OTHER <input type="checkbox"/> (Please specify) _____						
8. DOCUMENTATION CHECKLIST		REQUIRED		FOR DOT USE ONLY		
				RECEIVED		
		YES	NO	YES	NO	DATE
COMPLIANCE PROGRAM		X				
MASTER DRAWING LIST		X				
FLIGHT MANUAL SUPPLEMENT			X			
MAINTENANCE MANUAL SUPPLEMENT			X			
INSTRUCTIONS FOR CONTINUING AIRWORTHINESS			X			
ENGINEERING REPORTS		X				
DESIGN DRAWINGS			X			
MANUFACTURE DRAWINGS & INSTALLATION INSTRUCTIONS		X				
ELECTRICAL LOAD ANALYSIS			X			
DRAFT STC, LSTC OR RDA			X			
WEIGHT AND MOMENT CHANGE		X				
FLIGHT TEST DATA			X			
OTHER (Specify)						
9. APPLICANT'S REMARKS:						
10. In addition to the payment of Aircraft Certification approval fees as prescribed in Canadian Aviation Regulations (CAR) Section 104, I agree to reimburse Transport Canada incremental expenses as in Aviation Regulation Directive No. 3, or equivalent, as applicable. For further details governing cost recovery, refer to AMA 513/4.						
PER: 		Consultant		06 February, 2004		
SIGNATURE OF APPLICANTS		TITLE		DATE		
11.						
SIGNATURE OF REGIONAL ENGINEER		DATE				

***AERO*** Design Ltd.

**ENGINEERING REPORT  
ER591.01**

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**UTILITY POWER PROVISIONS**

**McDonnell Douglas (Hughes) 369D/E, 500N**

Approved: E. Burgoin, P. Eng.

Prepared by: Jeff Clarke

Revision 0

Date: 10 November, 2003

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## **1.0 INTRODUCTION**

Installation of up to 3 utility power outlets, with power supplied from the Utility Power circuit breaker switch located on the switch panel on the centre console. Only one outlet is to be used at any time. The locations are as follows: on the bulkhead near the floor in the aft cabin; on the forward side of the right hand forward passenger seat; on the bottom of the centre console.

## **2.0 REFERENCE**

MD Helicopters Inc. 369, 500N, 600N Maintenance Manual

MD Helicopters Inc. 369, 500N, 600N Illustrated Parts Book

AS50881, Rev. A

## **3.0 BASIS OF CERTIFICATION**

MD (Hughes) 500N – TCDS H-95

CAR 6, dated 20 December, 1956, including amendments 6-1 thru 6-5.

This installation:

CAR 6, dated 20 December, 1956, including amendments 6-1 thru 6-5.

## **4.0 ANALYSIS OF CURRENT AIRWORTHINESS DIRECTIVES (AD'S)**

There are no current AD's related to this project. A list of current AD's is in appendix A.

## 5.0 STRUCTURAL COMPLIANCE

The outlet is attached with four (4) #4 screws. It is attached either directly to the bulkhead, seat, or console, or is attached to a pair of brackets each attached with a #6 screw.

Installation of the plug has been considered and is determined to be sufficient for this installation.

The circuit breaker switch is existing.

## 6.0 ELECTRICAL COMPLIANCE

### 6.1 Compliance With CAR 6.601 – Functional and Installational Requirements

*Each item of equipment installed in a rotorcraft shall be-*

*(a) Of a type and design appropriate to perform its intended function;*

The circuit breaker switch used in this installation is existing for utility power. The receptacle is the same as is provided by the manufacturer for utility power.

*(b) Labeled as to its identification, function, or operational limitations, or any combination of these, whichever is applicable;*

The outlet(s) are labeled "UTILITY PWR".

*(c) Installed in accordance with specified limitations of the equipment; and*

The current applied to the circuit breaker switch, wiring and receptacle is within the limitations.

*(d) Demonstrated to function properly in the rotorcraft.*

This installation is for utility power provisions. It will not function unless something is plugged into it.

### 6.2 Compliance With CAR 6.620 – Electrical Systems and Equipment – Installation

*(a) Electrical systems and equipment shall be free from hazards in themselves, in their method of operation, and in their effects on other parts of the rotorcraft. They shall be protected from fuel, oil, water, other detrimental substances, and from mechanical damage.*

This installation is for electrical power provisions only. There is no effect on other rotorcraft systems until something is plugged into the receptacle. The wires are routed along existing bundles, and as such are protected as required.

*(b) The design of all components of the electrical system shall be appropriate for the intended use, and the components shall be capable of satisfactory operation over the entire range of environmental conditions encountered in the operation of the rotorcraft.*

The circuit breaker switch, wiring, terminals and receptacles are all MIL-spec parts. The design will allow satisfactory operation over the entire range of environmental conditions encountered in the operation of the rotorcraft.



*(c) Electrical sources of power shall have sufficient capacity during all normal flight operating conditions to supply the electrical load requirements without electrical or thermal distress. For emergency operating conditions the capacity of electrical power sources shall be sufficient for all electrical loads necessary to permit a safe landing.*

This installation uses a circuit breaker switch provided by the manufacturer for utility power. The switch can be turned off in an emergency situation.

### 6.3 Compliance with CAR 6.627 – Electric Cables

There are two possible circuit breaker switches that may be installed, depending on the serial number, 7.5A and 5A. Wiring is the same for both - 20 AWG. The 7.5A breaker is critical.

Note: MD (Hughes) uses 20 AWG for the 7.5A circuit and 22 AWG for the 5A circuit,

#### Power to Receptacle

Electrical system: 28 VDC

Type of operation: continuous

Assumptions, operating conditions and physical parameters.

Wire gage.	$G_a := 20$
Measured or estimated length of installed wire.	$L_o := 6\text{-ft}$
Assumed current load of wires in bundle.	$BL := 60\%$
Number of wires in bundle. (ref: AS50881, Rev. A, Fig. 4)	$n_{\text{wire}} := 20$
Bundle Load Factor (ref: AS50881, Rev. A, Fig. 4)	$f_{BL} := 0.42$
Expected maximum operating altitude	$Alt := 16000\text{ft}$
Altitude Load Factor (ref: AS50881, Rev. A, Fig. 5)	$f_{alt} := 0.920$
Ambient operating temperature.	$T_A := 25\text{-C}$
Maximum temperature rating of wire, (ref: AS50881, Rev. A, Table A-1)	$T_R := 150\text{-C}$
$\delta T := T_R - T_A$	Temperature differential.
	$\delta T = 125\text{-C}$
Capacity of single wire in free space. (ref: AS50881, Rev. A, Fig. 3)	$I_{\text{single\_wire}} = 20.5\text{-amp}$

$$I_{\max} := I_{\text{single\_wire}} \cdot f_{\text{BL}} \cdot f_{\text{alt}}$$

Maximum current capacity of wire under assumed conditions.

$$I_{\max} = 7.9 \cdot \text{amp}$$

Maximum continuous current as limited by circuit breaker.

$$I_2 := 7.5 \cdot \text{amp}$$

$$T_2 := T_A + (T_R - T_A) \cdot \sqrt{\frac{I_2}{I_{\max}}}$$

Steady state operating temperature under assumed fault conditions.

$$T_2 = 146.6^\circ\text{C}$$

**TEMPERATURE DOES NOT EXCEED WIRE RATING**

Maximum length of wire not to exceed allowable volt drop

At 20 °C

$$v_{\text{drop}} := 1 \cdot \text{volt}$$

Max. voltage drop for continuous current.

$$R = 0.00988 \frac{\text{ohm}}{\text{ft}}$$

Max. wire resistance @ 20 °C, ref: MIL-W-22759/16, Table I.

$$L_1 := \frac{1}{I_2 \cdot R} \cdot v_{\text{drop}}$$

Max. Length of wire for allowable voltage drop at 20°C.

$$L_1 = 13.5 \cdot \text{ft}$$

At wire steady state operating temperature,  $T_2 = 146.6^\circ\text{C}$

$$L_2 := \frac{254.5\text{C} \cdot (L_1)}{234.5\text{C} + T_2}$$

Max. Length of wire at steady state operating temperature.

$$L_2 = 9.0 \cdot \text{ft}$$

Measured or estimated length of installed wire.

$$L_0 = 6.0 \cdot \text{ft}$$

**LENGTH OF WIRE WILL NOT EXCEED 1 VOLT DROP**

Note: Most equipment intended to use this installation will function properly with more that 1 volt drop.

**APPENDIX A**

**CURRENT AD'S**



**AIRWORTHINESS DIRECTIVES**

Applicable to Canadian registered or manufactured aeronautical products

Database Last Updated: 2003-11-07

Directives Pertaining to Model: **HUGHES, 369D, 369E***54 ADs found*

Country:	AD Number:	AD Subject:	SB Reference:
US	<u>2003-08-51</u>	MD 369 VARIOUS MODELS - T/R PITCH BLADE HORN	
US	<u>2002-13-05R1</u>	MD HELICOPTERS 369D/E/F/FF - TAIL ROTOR GEARBOX	AEROMETALS SB-001
CF	<u>CF-2000-23</u>	ENGINE AIR INLET DEFLECTOR KIT	
US	<u>2000-25-52</u>	MAIN ROTOR BLADES - SPAR BONDED SURFACES	MSB 2100-2R2
US	<u>2000-08-22</u>	TOT INDICATING SYSTEM	369D-199
US	<u>99-20-12</u>	TO PREVENT FAILURE OF BRACKET P/N 369F55190-1	
US	<u>99-13-09</u>	TAIL ROTOR FORK ASSY P/N 369D21701-21	SB369D-198
US	<u>99-08-07</u>	ENGINE CONTROL RELAYS	SB369E-090
US	<u>99-04-12</u>	INPUT SHAFT COUPLING ASSEMBLY	
CF	<u>CF-98-15</u>	EXTERNAL RESCUE SYSTEMS	CAR 702.21
US	<u>98-21-12</u>	OVERRUNNING CLUTCH RETAINER	
US	<u>98-15-26</u>	MAIN BLADE CRACKING	
US	<u>98-09-02</u>	OVERRUNNING CLUTCH ASSEMBLY OUTER RACE FAILURE	DN-156.2 HN-215.2
US	<u>98-03-15</u>	SUPERCEDED BY 98-15-26	243R1,088R1,195R1
US	<u>98-01-13</u>	MAIN ROTOR BLADE SEPARATION	369D-194, 369E-087
US	<u>97-15-08</u>	MAIN ROTOR TRANSMISSION OUTPUT GEAR	DN189,EN82, FN69
US	<u>96-10-09</u>	MAIN ROTOR BLADE CHECK - ROOT END CRACKING	HN239DN188EN81FN67
US	<u>96-08-03</u>	FLIGHT TRAILS HELI. STC # SH6080NM HARDPOINT ASSY	
US	<u>95-03-13</u>	FAILURE OF M/R ASSY OR HUB LEAD-LAG LINK ASSY	SUPERCEDES 91-17-04
US	<u>95-03-11</u>	TAIL ROTOR BLADE ABRASION STRIPS	H238,D187,E80,F66
US	<u>94-24-04</u>	PITCH CONTROL ASSEMBLY LOCKWASHER	DN185 EN78 FN64
US	<u>94-18-08</u>	LOSS OF TAIL ROTOR BLADE ABRASION STRIPS	
US	<u>93-18-05</u>	FUEL LINE EMERGENCY SHUTOFF VALVE BLOCKAGE	SIN DN-181
US	<u>93-07-10</u>	YAW OSCILLATIONS DURING DESCENT WITH BAGGAGE POD	

CF	<u>CF-92-17</u>	FLIGHT LIMITATIONS WITH CARGO POD INSTALLED	
US	<u>91-08-02</u>	CRACKS - TAIL ROTOR BLADE ROOT FITTING	DN-177,EN-68,FN-55
US	<u>90-24-07</u>	MAIN ROTOR TRANSMISSION DRIVE ASSEMBLY	EN-57, DN-166.1, FN-45
US	<u>90-19-02</u>	OVERRUNNING CLUTCH ASSY	DN-164, EN-54, FN-44
US	<u>90-12-03</u>	TAIL ROTOR SWASHPLATE BEARING	DN-167, EN-58, FN-46
US	<u>90-01-08</u>	DRIVESHAFT COUPLING - ENGINE TO TRANSMISSION	DN-157, EN-47,
US	<u>89-23-14</u>	MAIN ROTOR COLLECTIVE TUBE	EN-48.1, DN-158.1
US	<u>89-20-02</u>	FOUR BLADED TAIL ROTOR HUB	DN-160, EN-50
US	<u>89-02-01R1</u>	MAIN ROTOR HUB RETENTION STRAPS	DN-154, EN-44, FN-33
CF	<u>CF-88-09</u>	TRANSMISSION RING GEAR CARRIER	DN-148.1, EN-36.1
US	<u>88-17-09R1</u>	TAIL ROTOR TRANSMISSION MOUNTING STUDS	EN-39, DN-151, FN-28
CF	<u>CF-87-03R3</u>	CANCELLATION NOTICE	
US	<u>87-18-11</u>	M/R TRANSMISSION T/R OUTPUT PINION	EN-35, DN-147, FN-24
US	<u>86-20-07</u>	TAIL ROTOR DRIVE SHAFT	EN-31.1, DN=143.1
US	<u>86-01-04</u>	TAIL ROTOR BLADES	EN-18+21, DN129+132
US	<u>84-12-01R1</u>	APPROVED ROTOR BLADES	DL-57, EL-5
US	<u>84-11-01</u>	CONTROL ROD	EN-13 SIC
US	<u>84-01-02R1</u>	M/R SWASHPLATE BEARING	EN-12, DN-125
US	<u>82-17-01</u>	OUTPUT GEARSHAFT ASSEMBLY	DN-148.1
US	<u>82-14-01</u>	CHADWICK AUX FUEL SYSTEM	VENDOR
US	<u>82-01-08</u>	LEVER CONTROL ROD	DN-87
US	<u>81-26-01R1</u>	MAIN ROTOR DRIVE SHAFT	DN-99, EN-4, FN-4
US	<u>80-25-01</u>	T/R DRIVESHAFT COUPLING	
US	<u>80-24-04</u>	AUTO-REIGNITION PLACARD RELOCATION	DN-100
US	<u>79-10-09</u>	TAIL ROTOR PITCH CONTROL ASSY	DN-37 SIC
US	<u>78-26-04</u>	TAIL ROTOR HUB ASSEMBLY	DN-27.1
US	<u>78-20-03</u>	FIRE SUPPRESION SYSTEM	
US	<u>77-21-04</u>	CLUTCH AND SHAFT ASSEMBLY	DN-9.2
US	<u>77-19-03</u>	MAIN ROTOR RETENTION STRAPS	DN-154
US	<u>77-05-03</u>	TAIL ROTOR CONTROL SYSTEM	DN-1

**AIRWORTHINESS DIRECTIVES**

Applicable to Canadian registered or manufactured aeronautical products

Database Last Updated: 2003-11-07

Directives Pertaining to Model: **MCDONNELL DOUGLAS HC, 500N***15 ADs found*

<b>Country:</b>	<b>AD Number:</b>	<b>AD Subject:</b>	<b>SB Reference:</b>
CF	<u>CF-2000-23</u>	ENGINE AIR INLET DEFLECTOR KIT	
US	<u>2000-25-52</u>	MAIN ROTOR BLADES - SPAR BONDED SURFACES	MSB 2100-2R2
US	<u>2000-08-22</u>	TOT INDICATING SYSTEM	500N-019
US	<u>99-25-08</u>	FORWARD + CENTER THRUSTER CONTROL CABLES	021/028
US	<u>99-20-12</u>	TO PREVENT FAILURE OF BRACKET P/N 369F55190-1	
US	<u>99-08-07</u>	ENGINE CONTROL RELAYS	500N-017
US	<u>99-04-12</u>	INPUT SHAFT COUPLING ASSEMBLY	SB500N-013
CF	<u>CF-98-15</u>	EXTERNAL RESCUE SYSTEMS	CAR 702.21
US	<u>98-21-12</u>	OVERRUNNING CLUTCH RETAINER	
US	<u>98-15-26</u>	MAIN BLADE CRACKING	SB 500-015R3
US	<u>98-03-15</u>	SUPERCEDED BY 98-15-26	500N-015R1
US	<u>98-01-13</u>	MAIN ROTOR BLADE SEPARATION	500N-014
US	<u>97-15-08</u>	MAIN ROTOR TRANSMISSION OUTPUT GEAR	NN-009
US	<u>96-10-09</u>	MAIN ROTOR BLADE CHECK - ROOT END CRACKING	NN-008
US	<u>96-08-03</u>	FLIGHT TRAILS HELI. STC # SH6080NM HARDPOINT ASSY	



***AERO*** Design Ltd.

**ENGINEERING REPORT  
ER598.02**

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**FIRE EXTINGUISHER RELOCATION  
McDonnell Douglas (Hughes) 369D/E, 500N**

Approved: E. Burgoin, P. Eng.

Prepared by: Jeff Clarke

Revision 0  
Date: 05 February, 2004

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## **1.0 INTRODUCTION**

There is a fire extinguisher in the cockpit of the 369D/E, and 500N, located in the cockpit, on the door frame in front of the pilot. Most of these rotorcraft are configured for left seat operations, so the fire extinguisher is on the left door post.

Installations such as the DynaNav Seisbag system have a display that must be in the pilot's view. As the brackets for the fire extinguisher are existing, it is an ideal location to mount a display. This requires the fire extinguisher to be relocated to the right side of the cockpit.

## **2.0 REFERENCE**

AERO Design Ltd. drawings 59807 and 59808  
Maintenance Manual CSP-HMI-2

## **3.0 BASIS OF CERTIFICATION**

369 D/E, TCDS H3WE:

CAR 6 dated December 20, 1956, including Amendments 6-1 through 6-4 and Special Conditions, "Conditions Establishing Compensating Factors Providing an Equivalent Level of Safety Under Civil Air Regulations, Section 6.10, for Light Turbine Powered Helicopters," dated October 2, 1962, as revised February 8, 1966.

500N, TCDS H-95:

CAR 6 dated December 20, 1956, including Amendments 6-1 through 6-5 and Special Condition, "Conditions Establishing Compensating Factors Providing an Equivalent Level of Safety Under Civil Air Regulations, Section 6.10, for Light Turbine Powered Helicopters," dated October 2, 1962, as revised February 8, 1966. In addition, height velocity testing is required to 7000 feet, in accordance with paragraphs 6.111 and 6.116, as amended by Amendment 6-7, issued October 8, 1963.

This installation:

CAR 6 dated December 20, 1956, including Amendments 6-1 through 6-5.

## **4.0 ANALYSIS OF CURRENT AIRWORTHINESS DIRECTIVES (AD'S)**

There are no current AD's related to this project. See Appendix A for a list of current AD's.

## 5.0 FIRE EXTINGUISHER

There is no requirement in CAR 6 to have a fire extinguisher located in the cabin of a helicopter. There is also no requirement for a fire extinguisher in the current amendment of FAR 27. FAR 29.851 states the following:

*(a) Hand fire extinguishers. For hand fire extinguishers the following apply:*

*(1) Each hand fire extinguisher must be approved.*

*(2) The kinds and quantities of each extinguishing agent used must be appropriate to the kinds of fires likely to occur where that agent is used.*

*(3) Each extinguisher for use in a personnel compartment must be designed to minimize the hazard of toxic gas concentrations.*

A fire extinguisher has been provided by the manufacturer on the forward door frame. As these rotorcraft are configured for left seat operation, the fire extinguisher is on the left door post. This installation uses the fire extinguisher mounts for the DynaViz display and moves the fire extinguisher to the right door post, which is a configuration provided by McDonnell Douglas, reference Maintenance Manual, Section 26-20-00, Figure 201 (see appendix B).

## 6.0 LOADS

The instruction/warning placard states that if the extinguisher weighs less than 4 lb. 9 oz. it must be filled. The fire extinguisher was weighed and found to be 5 lb.

$W := 5 \cdot \text{lbf}$  Weight of fire extinguisher

Load Factors

$n_{sf} := 1.5$  Safety Factor, ref CAR 6.200(b)

$n_{ff} := 1.15$  Fitting Factor, ref CAR 6.307(d)

Maneuvering Load Factors, Ref CAR 6.212

$n_{man\_pos} := 3.5$  Limit positive maneuvering load factor (downward)

$n_{man\_neg} := -1.0$  Limit negative maneuvering load factor (upward)

$n_{ult\_man\_pos} := n_{man\_pos} \cdot n_{sf}$

$n_{ult\_man\_pos} = 5.25$  Ultimate positive maneuvering load factor

$n_{ult\_man\_neg} := n_{man\_neg} \cdot n_{sf}$

$n_{ult\_man\_neg} = -1.5$  Ultimate negative maneuvering load factor



Emergency Landing Load Factors, Ref CAR 6.260

$n_{\text{emerg\_fwd}} := 4.0$	Forward
$n_{\text{emerg\_up}} := 1.5$	Upward
$n_{\text{emerg\_down}} := 4.0$	Downward
$n_{\text{emerg\_side}} := 2.0$	Sideward

Critical Loads

$$P_{\text{fwd}} := W \cdot n_{\text{emerg\_fwd}}$$

$$P_{\text{fwd}} = 20 \cdot \text{lbf} \quad \text{Forward load due to fire extinguisher}$$

$$P_{\text{up}} := W \cdot n_{\text{emerg\_up}}$$

$$P_{\text{up}} = 7.5 \cdot \text{lbf} \quad \text{Upward load due to fire extinguisher}$$

$$P_{\text{down}} := W \cdot n_{\text{ult\_man\_pos}}$$

$$P_{\text{down}} = 26.3 \cdot \text{lbf} \quad \text{Downward load due to fire extinguisher}$$

$$P_{\text{side}} := W \cdot n_{\text{emerg\_side}}$$

$$P_{\text{side}} = 10 \cdot \text{lbf} \quad \text{Sideward load due to fire extinguisher}$$

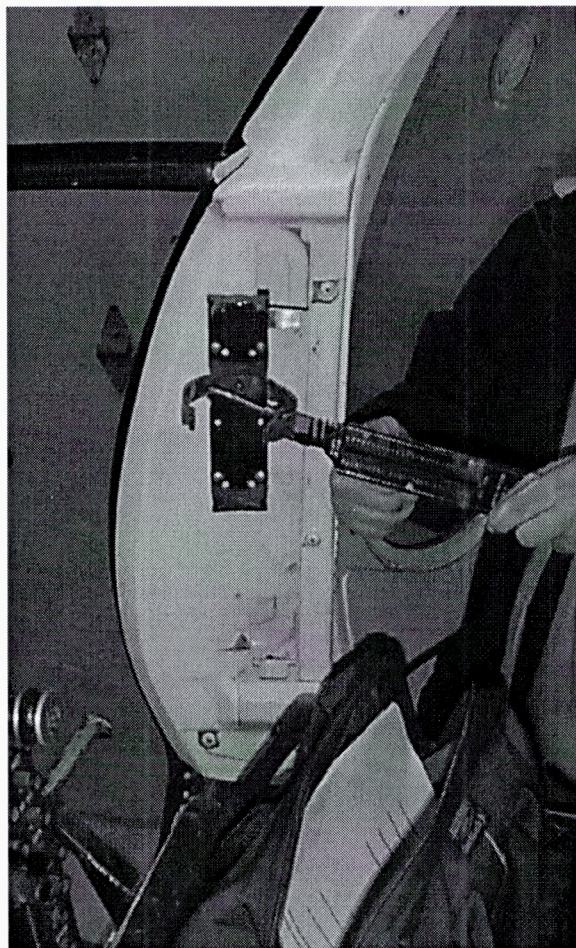
## 6.0 STRUCTURAL COMPLIANCE

Compliance is shown by test. There are two configurations that may be installed. Configuration 59807-01 uses brackets similar to the ones provided by the manufacturer. Configuration 59808-01 has a plate mounted on the cabin liner that picks up on the cabin liner mounts.

As the 59807-01 configuration uses flanged brackets, the bending strength is much higher than the flat plate used in the 59808-01 configuration. The 59808-01 configuration was used for the test.

### 6.1 Forward Load Condition

The critical forward load is 20 lb. It was not possible to pull the bracket forward, so it was pulled aft. This condition is more critical because there is only one screw securing the forward end.



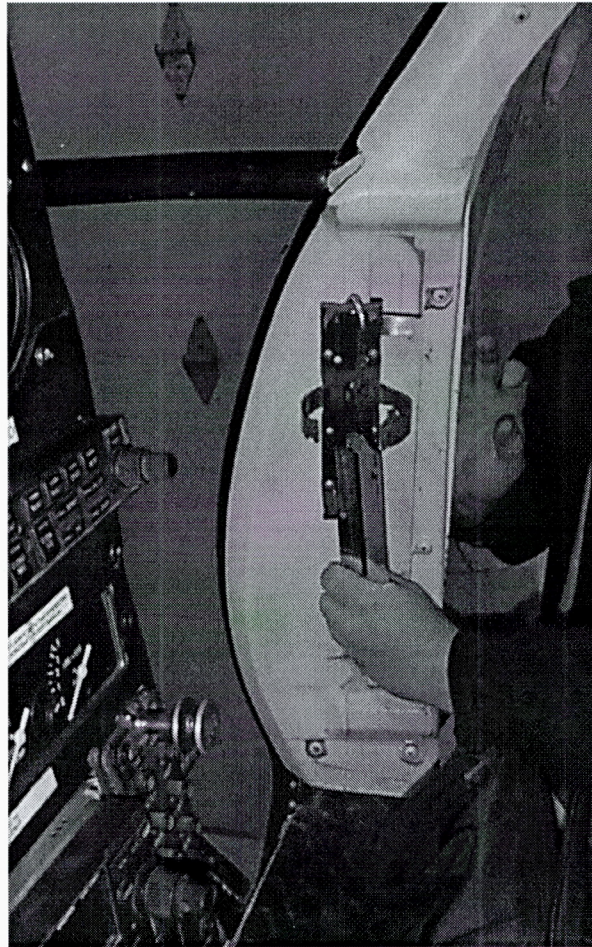
Picture 1 – Forward Load Condition

The fire extinguisher bracket was pulled aft 25 lb. There was no permanent deformation of the bracket or the cabin liner.



## 6.2 Downward Load Condition

The critical downward load is 26.3 lb. This condition is more critical than the upward load condition.



Picture 2 – Downward Load Condition

The fire extinguisher bracket was pulled down 30 lb. There was no permanent deformation of the bracket or cabin liner.

## 6.3 Sideward Load Condition

The critical sideward load is 10 lb. The ends of the retaining strap were pulled in excess of 15 lb. to the side. There was no permanent deformation of the bracket or the cabin liner.

**APPENDIX A**

**CURRENT AD'S**



Country:	AD Number:	AD Subject:	SB Reference:	Model
US	<u>2003-24-01</u>	MD 369 MODELS - MAIN ROTOR BLADE INSPECTION	MSB 2100-3R2	369D, E
US	<u>2003-08-51</u>	MD 369 VARIOUS MODELS - T/R PITCH BLADE HORN		369D, E
US	<u>2002-13-05R1</u>	MD HELICOPTERS 369D/E/F/FF - TAIL ROTOR GEARBOX	AEROMETALS SB-001	369D, E
CF	<u>CF-2000-23</u>	ENGINE AIR INLET DEFLECTOR KIT		369D, E, 500N
US	<u>2000-25-52</u>	MAIN ROTOR BLADES - SPAR BONDED SURFACES	MSB 2100-2R2	369D, E, 500N
US	<u>2000-08-22</u>	TOT INDICATING SYSTEM	369D-199	369D, E, 500N
US	<u>99-25-08</u>	FORWARD & CENTER THRUSTER CONTROL CABLES	021/028	500N
US	<u>99-20-12</u>	TO PREVENT FAILURE OF BRACKET P/N 369F55190-1		369D, E, 500N
US	<u>99-13-09</u>	TAIL ROTOR FORK ASSY P/N 369D21701-21	SB369D-198	369D, E
US	<u>99-08-07</u>	ENGINE CONTROL RELAYS	SB369E-090	369D, E, 500N
US	<u>99-04-12</u>	INPUT SHAFT COUPLING ASSEMBLY		369D, E, 500N
CF	<u>CF-98-15</u>	EXTERNAL RESCUE SYSTEMS	CAR 702.21	369D, E, 500N
US	<u>98-21-12</u>	OVERRUNNING CLUTCH RETAINER		369D, E, 500N
US	<u>98-15-26</u>	MAIN BLADE CRACKING		369D, E, 500N
US	<u>98-09-02</u>	OVERRUNNING CLUTCH ASSEMBLY OUTER RACE FAILURE	DN-156.2 HN-215.2	369D, E
US	<u>98-03-15</u>	SUPERCEDED BY 98-15-26	243R1,088R1,195R1	369D, E, 500N
US	<u>98-01-13</u>	MAIN ROTOR BLADE SEPARATION	369D-194, 369E-087	369D, E, 500N
US	<u>97-15-08</u>	MAIN ROTOR TRANSMISSION OUTPUT GEAR	DN189,EN82, FN69	369D, E, 500N
US	<u>96-10-09</u>	MAIN ROTOR BLADE CHECK - ROOT END CRACKING	HN239DN188EN81FN67	369D, E, 500N
US	<u>96-08-03</u>	FLIGHT TRAILS HELI. STC # SH6080NM HARDPOINT ASSY		369D, E, 500N
US	<u>95-03-13</u>	FAILURE OF M/R ASSY OR HUB LEAD-LAG LINK ASSY	SUPERCEDES 91-17-04	369D, E
US	<u>95-03-11</u>	TAIL ROTOR BLADE ABRASION STRIPS	H238,D187,E80,F66	369D, E
US	<u>94-24-04</u>	PITCH CONTROL ASSEMBLY LOCKWASHER	DN185 EN78 FN64	369D, E
US	<u>94-18-08</u>	LOSS OF TAIL ROTOR BLADE ABRASION STRIPS		369D, E
US	<u>93-18-05</u>	FUEL LINE EMERGENCY SHUTOFF VALVE BLOCKAGE	SIN DN-181	369D, E
US	<u>93-07-10</u>	YAW OSCILLATIONS DURING DESCENT WITH BAGGAGE POD		369D, E
CF	<u>CF-92-17</u>	FLIGHT LIMITATIONS WITH CARGO POD INSTALLED		369D, E

US	<u>91-08-02</u>	CRACKS - TAIL ROTOR BLADE ROOT FITTING	DN-177,EN-68,FN-55	369D, E
US	<u>90-01-08</u>	DRIVESHAFT COUPLING - ENGINE TO TRANSMISSION	DN-157,EN-47,	369D, E
US	<u>90-12-03</u>	TAIL ROTOR SWASHPLATE BEARING	DN-167,EN-58,FN-46	369D, E
US	<u>90-19-02</u>	OVERRUNNING CLUTCH ASSY	DN-164, EN-54, FN-44	369D, E
US	<u>90-24-07</u>	MAIN ROTOR TRANSMISSION DRIVE ASSEMBLY	EN-57,DN-166.1,FN-45	369D, E
US	<u>89-02-01R1</u>	MAIN ROTOR HUB RETENTION STRAPS	DN-154, EN-44, FN-33	369D, E
US	<u>89-20-02</u>	FOUR BLADED TAIL ROTOR HUB	DN-160, EN-50	369D, E
US	<u>89-23-14</u>	MAIN ROTOR COLLECTIVE TUBE	EN-48.1,DN-158.1	369D, E
CF	<u>CF-88-09</u>	TRANSMISSION RING GEAR CARRIER	DN-148.1,EN-36.1	369D, E
US	<u>88-17-09R1</u>	TAIL ROTOR TRANSMISSION MOUNTING STUDS	EN-39, DN-151,FN-28	369D, E
US	<u>87-18-11</u>	M/R TRANSMISSION T/R OUTPUT PINION	EN-35,DN-147,FN-24	369D, E
US	<u>86-20-07</u>	TAIL ROTOR DRIVE SHAFT	EN-31.1,DN=143.1	369D, E
US	<u>86-01-04</u>	TAIL ROTOR BLADES	EN-18&21,DN129&132	369D, E
US	<u>84-12-01R1</u>	APPROVED ROTOR BLADES	DL-57, EL-5	369D, E
US	<u>84-11-01</u>	CONTROL ROD	EN-13 SIC	369D, E
US	<u>84-01-02R1</u>	M/R SWASHPLATE BEARING	EN-12,DN-125	369D, E
US	<u>82-17-01</u>	OUTPUT GEARSHAFT ASSEMBLY	DN-148.1	369D
US	<u>82-14-01</u>	CHADWICK AUX FUEL SYSTEM	VENDOR	369D
US	<u>82-01-08</u>	LEVER CONTROL ROD	DN-87	369D
US	<u>81-26-01R1</u>	MAIN ROTOR DRIVE SHAFT	DN-99,EN-4,FN-4	369D, E
US	<u>80-25-01</u>	T/R DRIVESHAFT COUPLING		369D
US	<u>80-24-04</u>	AUTO-REIGNITION PLACARD RELOCATION	DN-100	369D
US	<u>79-10-09</u>	TAIL ROTOR PITCH CONTROL ASSY	DN-37 SIC	369D
US	<u>78-26-04</u>	TAIL ROTOR HUB ASSEMBLY	DN-27.1	369D
US	<u>78-20-03</u>	FIRE SUPPRESION SYSTEM		369D
US	<u>77-21-04</u>	CLUTCH AND SHAFT ASSEMBLY	DN-9.2	369D
US	<u>77-19-03</u>	MAIN ROTOR RETENTION STRAPS	DN-154	369D
US	<u>77-05-03</u>	TAIL ROTOR CONTROL SYSTEM	DN-1	369D

## **APPENDIX B**

### **MAINTENANCE MANUAL EXCERPT**



Main Menu ....X  
Book TOC ....X  
Chapter TOC ..X

The Boeing Company  
MAINTENANCE MANUAL

CSP-HMI-2

## FIRE EXTINGUISHER MAINTENANCE PRACTICES

### 1. Fire Extinguisher - General

(Ref. Figure 201) The early model helicopters use the pressurized, dry chemical type of fire extinguisher. The current models use a liquified gas which discharges as a vapor at high nozzle velocity. The L/H and R/H command fire extinguishers mount on the forward door frame between the crew door and the canopy. The fire extinguisher quickly detaches from the mounting bracket by unfastening the quick-release clasps. Note the current fire extinguishers are equipped with two straps for extra high vibration applications.

### 2. Fire Extinguisher Operation

- a. Grasp fire extinguisher handle with one hand. Use the thumb and forefinger of the other hand to unfasten the quick-release clasp.

- b. Remove fire extinguisher from mounting bracket.
- c. Remove safety pin from handle. Point nozzle toward base of flame and squeeze the handle.

### 3. Fire Extinguisher Servicing/ Inspection

The fire extinguishers are equipped with a pressure gage that indicates normal, charge, and over-charge pressures.

- a. Dry chemical type - white area indicates normal operating range of 150 psi. Red area indicates CHARGE or OVERCHARGE.
- b. Halon type - green area indicates normal operating range of 125 psi. Red area indicates CHARGE or OVERCHARGE.

Service the fire extinguishers in accordance with manufacturer's instructions.

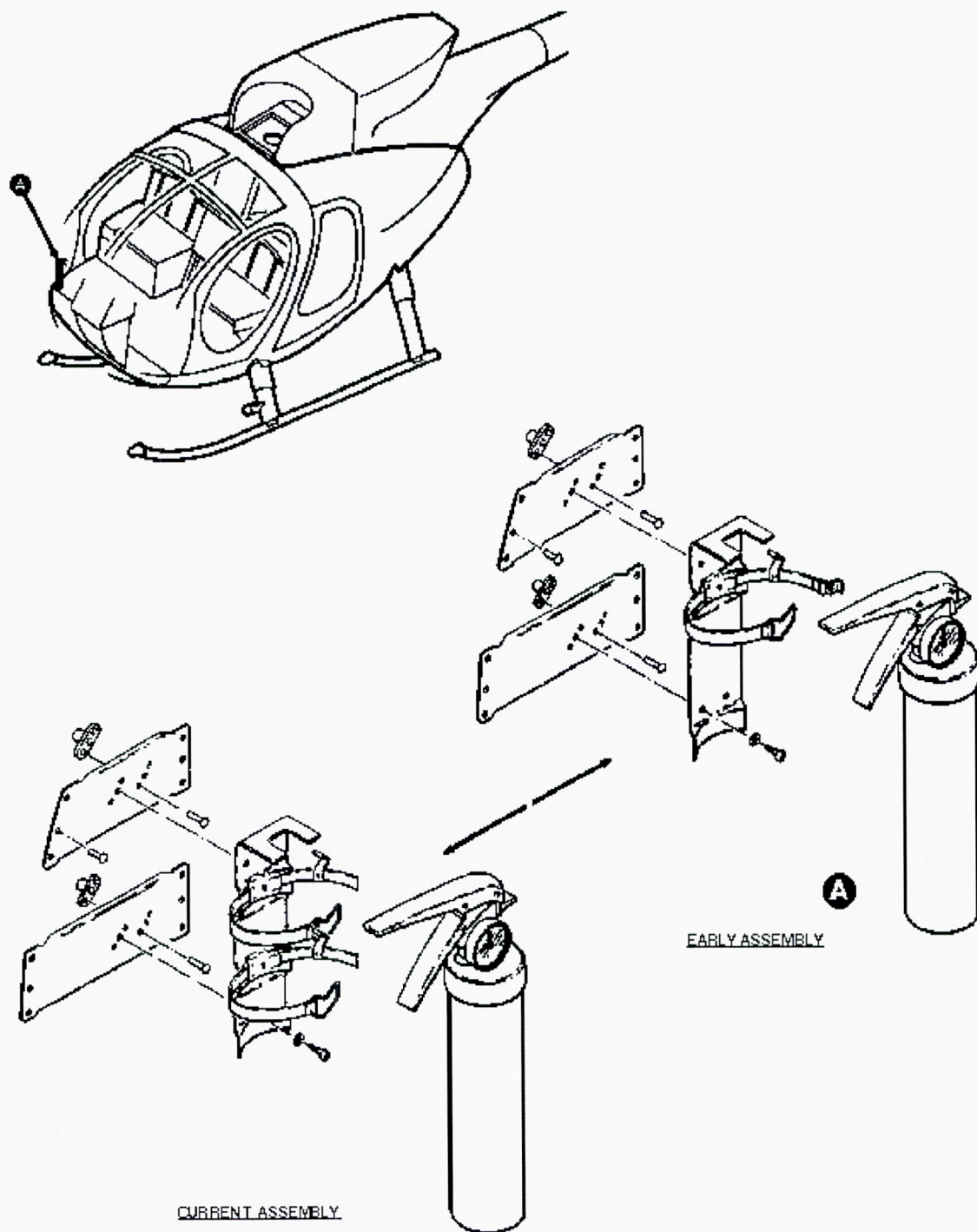
EFFECTIVITY: ALL
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Page 201  
Original



CSP-HMI-2

The Boeing Company  
MAINTENANCE MANUAL**Main Menu** ....x  
**Book TOC** ....x  
**Chapter TOC** ..x

G26-2001

Figure 201. Fire Extinguisher Installation (R/H)

Page 202  
Original**26-20-00****EFFECTIVITY: ALL**

***AERO*** Design Ltd.

**ENGINEERING REPORT  
ER598.01**

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**SEISBAG SYSTEM INSTALLATION**

**McDonnell Douglas (Hughes) 369 D/E, 500N**

Approved: E. Burgoin, P. Eng.

Prepared by: Jeff Clarke

Revision 0

Date: 02 February, 2004

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## **1.0 INTRODUCTION**

The Dyna-Nav System is installed in AS350 Helicopters under various LSTC's and STC SH02-26.

The system consists of a data processor computer weighing approx. 15 lb. to be secured in the aft cabin, under the passenger seats, a display mounted in the pilot compartment, a GPS antenna, and a telemetry antenna.

## **2.0 REFERENCE**

AERO Design Ltd. drawings 59801 thru 59809

McDonnell Douglas 369D/E, 500N, 600N Illustrated Parts Book

McDonnell Douglas 369D/E, 500N, 600N Maintenance Manual

MIL-HDBK-5J

## **3.0 BASIS OF CERTIFICATION**

369 D/E, TCDS H3WE:

CAR 6 dated December 20, 1956, including Amendments 6-1 through 6-4 and Special Conditions, "Conditions Establishing Compensating Factors Providing an Equivalent Level of Safety Under Civil Air Regulations, Section 6.10, for Light Turbine Powered Helicopters," dated October 2, 1962, as revised February 8, 1966.

500N, TCDS H-95:

CAR 6 dated December 20, 1956, including Amendments 6-1 through 6-5 and Special Condition, "Conditions Establishing Compensating Factors Providing an Equivalent Level of Safety Under Civil Air Regulations, Section 6.10, for Light Turbine Powered Helicopters," dated October 2, 1962, as revised February 8, 1966. In addition, height velocity testing is required to 7000 feet, in accordance with paragraphs 6.111 and 6.116, as amended by Amendment 6-7, issued October 8, 1963.

This installation:

CAR 6 dated December 20, 1956, including Amendments 6-1 through 6-5.

## **4.0 ANALYSIS OF CURRENT AIRWORTHINESS DIRECTIVES (AD'S)**

There are no current AD's related to this project. See Appendix A for a list of current AD's.



## 5.0 LOADS

### 5.1 Load Factors

$n_{sf} = 1.5$  Safety Factor (Ref: CAR 6.200(b))

$n_{fig} = 1.15$  Fitting Factor (Ref: CAR 6.307(d))

Maneuvering Load Factors (Ref: CAR 6.212)

$n_{lim\_man\_pos} = 3.5$  Limit positive maneuvering load factor

$n_{lim\_man\_neg} = 1.0$  Limit negative maneuvering load factor

$n_{ult\_man\_pos} = n_{lim\_man\_pos} \times n_{sf}$

$n_{ult\_man\_pos} = 5.25$  Ultimate positive maneuvering load factor

$n_{ult\_man\_neg} = n_{lim\_man\_neg} \times n_{sf}$

$n_{ult\_man\_neg} = 1.5$  Ultimate negative maneuvering load factor

Emergency Landing Load Factors (Ref: CAR 6.260)

$n_{fwd\_emerg} = 4.0$  Ultimate forward emergency landing load factor

$n_{down\_emerg} = 4.0$  Ultimate downward emergency landing load factor

$n_{up\_emerg} = 1.5$  Ultimate upward emergency landing load factor

$n_{side\_emerg} = 2.0$  Ultimate sideward emergency landing load factor

Critical Load Factors

The forward, upward and sideward emergency landing loads and the ultimate positive maneuvering load factors are critical.

### 5.2 DynaByte Computer

The DynaByte computer is installed on a frame made of 4130 steel tubing. The frame is attached at the aft end to the existing inboard seat brackets which are not used with the bench seat installed, and at the forward end it is attached to the forward holes for seat back adjustment.

$W_{DB} := 13 \cdot \text{lbf}$  Weight of DynaByte computer

$W_{DB\_frame} := 2 \cdot \text{lbf}$  Weight of frame

$W_{DB\_total} := W_{DB} + W_{DB\_frame}$

$W_{DB\_total} = 15.0 \cdot \text{lbf}$  Total weight of DynaByte computer installation

The loads are as follows:

$$P_{DB\_fwd} := W_{DB\_total} \cdot n_{emerg\_fwd}$$

$$P_{DB\_fwd} = 60.0 \cdot \text{lbf} \quad \text{Forward load due to DynaByte installation}$$

$$P_{DB\_up} := W_{DB\_total} \cdot n_{emerg\_up}$$

$$P_{DB\_up} = 22.5 \cdot \text{lbf} \quad \text{Upward load due to DynaByte installation}$$

$$P_{DB\_down} := W_{DB\_total} \cdot n_{ult\_man\_pos}$$

$$P_{DB\_down} = 78.8 \cdot \text{lbf} \quad \text{Downward load due to DynaByte installation}$$

$$P_{DB\_side} := W_{DB\_total} \cdot n_{emerg\_side}$$

$$P_{DB\_side} = 30.0 \cdot \text{lbf} \quad \text{Sideward load due to DynaByte installation}$$

### 5.3 DynaViz Display

The DynaViz display is mounted on a hinged bracket that is attached to existing anchor nuts for the fire extinguisher installation.

$$P_{DV\_fwd} := W_{DV} \cdot n_{emerg\_fwd}$$

$$P_{DV\_fwd} = 8.0 \cdot \text{lbf} \quad \text{Forward load due to DynaByte installation}$$

$$P_{DV\_up} := W_{DV} \cdot n_{emerg\_up}$$

$$P_{DV\_up} = 3.0 \cdot \text{lbf} \quad \text{Upward load due to DynaByte installation}$$

$$P_{DV\_down} := W_{DV} \cdot n_{ult\_man\_pos}$$

$$P_{DV\_down} = 10.5 \cdot \text{lbf} \quad \text{Downward load due to DynaByte installation}$$

$$P_{DV\_side} := W_{DV} \cdot n_{emerg\_side}$$

$$P_{DV\_side} = 4.0 \cdot \text{lbf} \quad \text{Sideward load due to DynaByte installation}$$

### 5.4 GPS Antenna

The GPS antenna weighs approximately 2 lb. It is attached to the lateral window frame on the right side, or on top of the “doghouse” on the cowl aft of the rotor mast. There are no significant loads generated by this antenna.

### 5.5 Telemetry Antenna

The telemetry antenna is a whip type antenna that is approximately 3.5” long. It is installed on the bottom of the fuselage. There are no significant loads generated by this antenna.

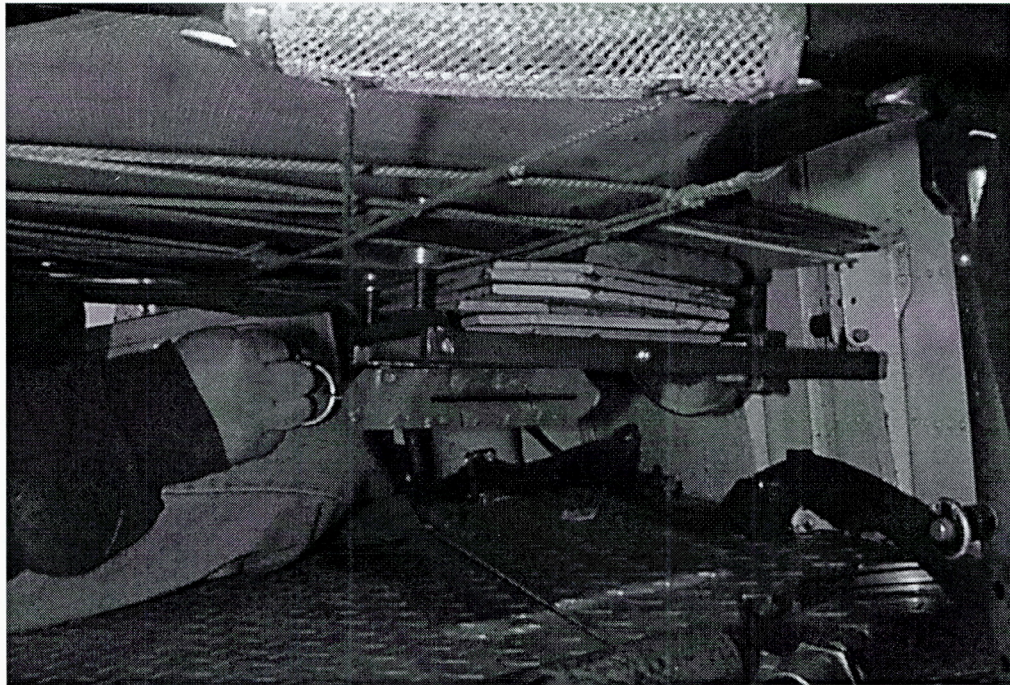
## 6.0 STRUCTURAL COMPLIANCE

### 6.1 DynaByte Computer

Compliance is shown by test.

#### 6.1.2 Forward and Downward Load Condition

The critical forward load is 60 lb. and the critical down load is 79 lb. The loads were applied simultaneously.



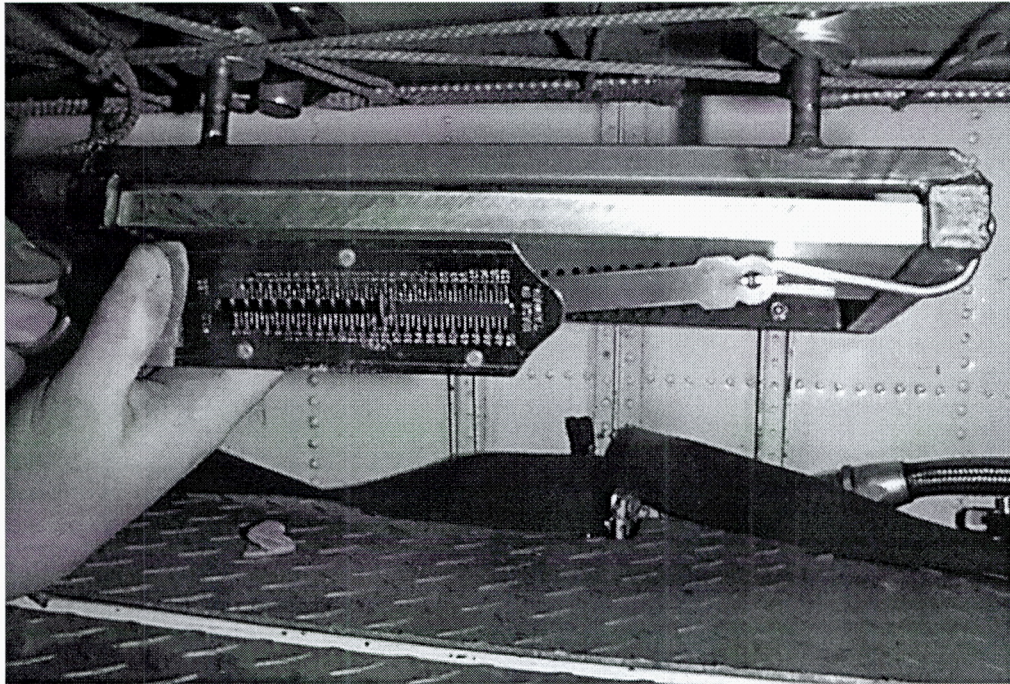
Picture 1 – Forward and Down Load Application

The spring scale was pulled forward to read 80 lb. and 100lb. of lead ballast was stacked on top of the frame. There was no permanent deformation of the frame, the seat brackets or the seat.



### 6.1.3 Sideward Load Condition

The critical sideward load is 30 lb.



Picture 2 – Sideward Load Application

The spring scale was pulled to the side to read 60 lb. There was no permanent deformation of the frame, the seat brackets or the seat.



#### 6.1.4 Upward Load Condition

The critical upward load is 22.5 lb.



Picture 3 – Upward Load Application

The spring scale was pulled up to read 30 lb. There was no permanent deformation of the frame, the seat brackets or the seat.

#### 6.1.5 Seat

The seat must withstand the loads applied by the occupants and this installation. The seatbelts are attached to the rear bulkhead, not to the seat. Therefore, the loads applied by the emergency landing condition are not applied to the seat frame, except for the downward load. The maneuvering condition is the critical downward load.

If there are two people sitting in the seat, in the maneuvering condition the load applied is:

$$2 \times 170 \text{ lb} \times 5.25 = 1785 \text{ lb.}$$

Adding the 78.8 lb. for the DynaByte in the maneuvering condition is an increase in load of less than 5%. Also a portion of this load is distributed to the aft attachment.

The load is applied to the seat where the cross section is a 1.25" OD x 0.125" wall tube, with a 1.0" OD x 0.049" wall tube inside. The distance for the load from the DynaByte to be carried from the attachment to the back tube of the seat is 2.7". The bending moment caused by this is not significant compared to that from the seat occupants.

The seat has been considered and determined to be not critical.

## 6.2 DynaViz Display

As the display is not above or behind the pilot or passengers, the requirements of CAR 6.260 do not apply. The loads from CAR 6.260 will be used for good design practice.

The DynaViz display is attached to the existing brackets for holding the fire extinguisher, which weighs more than the display. The display is attached to one flange of a hinge with two #6-32 screws into the plastic case for the display, and the other flange is attached to the fire extinguisher brackets with four #10-32 screws.

The display was pulled forward, down and to the side in excess of 15 lb, with no deformation or failure of the display or the attachments.

## 6.3 GPS Antenna

The GPS Antenna is attached to the horizontal window frame with two #10 screws. The antenna was pulled aft (could not pull forward due to window), to the side and down in excess of 15 lb. There was no permanent deformation of the bracket or window frame.

The "doghouse" cowl is a non-structural fibre-glass panel. It does not carry any basic helicopter loads. The antenna is low profile so there is no significant drag load or yaw loads on the antenna. The installation has been considered, and determined to be sufficient.

## 6.4 Telemetry Antenna

The telemetry antenna is too small to develop any significant load. A 0.040" doubler is installed with MS20470AD4 rivets.

## 7.0 COMPLIANCE WITH CAR 6.350 – PILOT COMPARTMENT; GENERAL

*(a) The arrangement of the pilot compartment and its appurtenances shall provide safety and assurance that the pilot will be able to perform all of his duties and operate the controls in the correct manner without unreasonable concentration and fatigue.*

This installation decreases pilot work load.

*(b) When provision is made for a second pilot, the rotorcraft shall be controllable with equal safety from both seats.*

Not applicable – rotorcraft used for single pilot operations.

*(c) Vibration and noise characteristics of cockpit appurtenances shall not interfere with safe operation of the rotorcraft.*

No change from Type Approved configuration.



## 8.0 COMPLIANCE WITH CAR 6.351 – PILOT COMPARTMENT VISION

*The pilot compartment shall be arranged to afford the pilot a sufficiently extensive, clear, and undistorted view for the safe operation of the rotorcraft. During flight in moderate rain condition the pilot shall have an adequate view of the flight path in normal flight and landing, and have sufficient protection from the elements so that his vision is not unduly impaired. The pilot compartment shall be free of glare and reflections which would interfere with the pilot's vision. For rotorcraft intended for night operation, the demonstration of these qualities shall include night flight tests.*

Display is mounted on the cabin wall in front of the pilot. It is mounted so that it can rotate forward (stowed position). When it is stowed, the display does not impinge on the pilot's view out the windshield. When in use, the display is small enough to be looked over and around for safe operation of the rotorcraft.

No change from Type Approved configuration for protection from the elements.

Night flight use is not applicable – intended for day VFR use.

## 9.0 COMPLIANCE WITH CAR 6.353 – CONTROLS

*(a) All cockpit controls shall be located to provide convenience in operation and in a manner tending to prevent confusion and inadvertent operation.*

Controls are located on the collective stick head. Inadvertent operation does not endanger the rotorcraft.

*(b) The controls shall be so located and arranged with respect to the pilots' seats that there exists full and unrestricted movement of each control without interference from either the cockpit structure or the pilots' clothing when seated. This shall be demonstrated for individuals ranging from 5' 2" to 6' 0" in height.*

Controls for the system consist of a hat switch and buttons or switches, located on the collective stick head. The installation does not interfere with the range of motion for the collective.

## 10.0 COMPLIANCE WITH CAR 6.601 – FUNCTION AND INSTALLATION

*Each item of equipment installed in a rotorcraft shall be-*

*(a) Of a type and design appropriate to perform its intended function;*

The DynaNav Seisbag system is of a type and design appropriate to perform its intended function. The GPS and Telemetry antennas are specified by DynaNav for use with this system.

*(b) Labeled as to its identification, function, or operational limitations, or any combination of these, whichever is applicable;*

The computer is labeled "DynaFlight – Seisbag". The display is labeled "DynaViz Display". The switches/buttons are labeled to their functions.



*(c) Installed in accordance with specified limitations of the equipment; and*

Specifications given by manufacturer:

Operating Temperature	-40 to +50°C
Humidity	5-95%, non-condensing
Electrical	18-36 VDC, negative ground

This installation is within these limitations.

*(d) Demonstrated to function properly in the rotorcraft.*

Service experience with the Seisbag system on the AS350 and Hughes 369 has shown it will function properly in the rotorcraft environment.

## **11.0 COMPLIANCE WITH CAR 6.620 – INSTALLATION**

*(a) Electrical systems and equipment shall be free from hazards in themselves, in their method of operation, and in their effects on other parts of the rotorcraft. They shall be protected from fuel, oil, water, other detrimental substances, and from mechanical damage.*

The DynaNav Seisbag system is installed using MIL-spec or existing wiring, components and materials. Wire routing is in accordance with AC43.13-1B. EMI/RMI test was performed in TR560.02, for approval C-LSA03-097/D to determine if there was interference with the rotorcraft systems. No interference was found.

*(b) The design of all components of the electrical system shall be appropriate for the intended use, and the components shall be capable of satisfactory operation over the entire range of environmental conditions encountered in the operation of the rotorcraft.*

The DynaNav Seisbag system uses Mil-Spec components. The environmental conditions encountered in the operation of the rotorcraft are within the specified limitations for the equipment.

*(c) Electrical sources of power shall have sufficient capacity during all normal flight operating conditions to supply the electrical load requirements without electrical or thermal distress. For emergency operating conditions the capacity of electrical power sources shall be sufficient for all electrical loads necessary to permit a safe landing.*

This installation uses power provisions that are connected to an existing circuit breaker switch provided by the manufacturer.

## **12.0 COMPLIANCE WITH CAR 6.627 – ELECTRIC CABLES**

The DynaNav system comes with most of the cables required for the installation. Power is supplied by an approved utility plug (7.5A). Wiring to the plug is 20 AWG, and wiring from the plug to the processor is also 20 AWG.

**Power to DynaByte Processor**

Electrical system: 28 VDC

Type of operation: continuous

Assumptions, operating conditions and physical parameters.

	Wire gage	$Ga := 20$
	Measured or estimated length of installed wire.	$L_o := 15 \cdot \text{ft}$
	Assumed current load of wires in bundle.	$BL := 100\%$
	Number of wires in bundle.	$n_{\text{wire}} := 2$
	Bundle Load Factor (ref: AS50881, Rev. A, Fig. 4)	$f_{BL} := 0.84$
	Expected maximum operating altitude (Ref: 500N TCDS)	$Alt := 20000 \text{ ft}$
	Altitude Load Factor (ref: AS50881, Rev. A, Fig. 5)	$f_{alt} := 0.91$
	Ambient operating temperature	$T_A := 25 \cdot \text{C}$
	Maximum temperature rating of wire, (ref: AS50881, Rev. A, Table A-1)	$T_R := 150 \cdot \text{C}$
$\delta T := T_R - T_A$	Temperature differential.	$\delta T = 125 \cdot \text{C}$
	Capacity of single wire in free space. (ref: AS50881, Rev. A, Fig. 3)	$I_{\text{single\_wire}} := 20.5 \text{ amp}$
$I_{\text{max}} := I_{\text{single\_wire}} \cdot f_{BL} \cdot f_{alt}$	Maximum current capacity of wire under assumed conditions	$I_{\text{max}} = 15.7 \cdot \text{amp}$
	Maximum continuous current as limited by circuit breaker.	$I_2 := 7.5 \cdot \text{amp}$
$T_2 := T_A + (T_R - T_A) \cdot \sqrt{\frac{I_2}{I_{\text{max}}}}$	Steady state operating temperature under assumed fault conditions.	$T_2 = 111.5 \cdot \text{C}$

**TEMPERATURE DOES NOT EXCEED WIRE RATING**

The voltage drop is not critical as the unit will operate with 18-36 VDC input.

**APPENDIX A**

**CURRENT AD'S**



Country:	AD Number:	AD Subject:	SB Reference:	Model
US	<u>2003-24-01</u>	MD 369 MODELS - MAIN ROTOR BLADE INSPECTION	MSB 2100-3R2	369D, E
US	<u>2003-08-51</u>	MD 369 VARIOUS MODELS - T/R PITCH BLADE HORN		369D, E
US	<u>2002-13-05R1</u>	MD HELICOPTERS 369D/E/F/FF - TAIL ROTOR GEARBOX	AEROMETALS SB-001	369D, E
CF	<u>CF-2000-23</u>	ENGINE AIR INLET DEFLECTOR KIT		369D, E, 500N
US	<u>2000-25-52</u>	MAIN ROTOR BLADES - SPAR BONDED SURFACES	MSB 2100-2R2	369D, E, 500N
US	<u>2000-08-22</u>	TOT INDICATING SYSTEM	369D-199	369D, E, 500N
US	<u>99-25-08</u>	FORWARD & CENTER THRUSTER CONTROL CABLES	021/028	500N
US	<u>99-20-12</u>	TO PREVENT FAILURE OF BRACKET P/N 369F55190-1		369D, E, 500N
US	<u>99-13-09</u>	TAIL ROTOR FORK ASSY P/N 369D21701-21	SB369D-198	369D, E
US	<u>99-08-07</u>	ENGINE CONTROL RELAYS	SB369E-090	369D, E, 500N
US	<u>99-04-12</u>	INPUT SHAFT COUPLING ASSEMBLY		369D, E, 500N
CF	<u>CF-98-15</u>	EXTERNAL RESCUE SYSTEMS	CAR 702.21	369D, E, 500N
US	<u>98-21-12</u>	OVERRUNNING CLUTCH RETAINER		369D, E, 500N
US	<u>98-15-26</u>	MAIN BLADE CRACKING		369D, E, 500N
US	<u>98-09-02</u>	OVERRUNNING CLUTCH ASSEMBLY OUTER RACE FAILURE	DN-156.2 HN-215.2	369D, E
US	<u>98-03-15</u>	SUPERCEDED BY 98-15-26	243R1,088R1,195R1	369D, E, 500N
US	<u>98-01-13</u>	MAIN ROTOR BLADE SEPARATION	369D-194, 369E-087	369D, E, 500N
US	<u>97-15-08</u>	MAIN ROTOR TRANSMISSION OUTPUT GEAR	DN189,EN82, FN69	369D, E, 500N
US	<u>96-10-09</u>	MAIN ROTOR BLADE CHECK - ROOT END CRACKING	HN239DN188EN81FN67	369D, E, 500N
US	<u>96-08-03</u>	FLIGHT TRAILS HELI. STC # SH6080NM HARDPOINT ASSY		369D, E, 500N
US	<u>95-03-13</u>	FAILURE OF M/R ASSY OR HUB LEAD-LAG LINK ASSY	SUPERCEDES 91-17-04	369D, E
US	<u>95-03-11</u>	TAIL ROTOR BLADE ABRASION STRIPS	H238,D187,E80,F66	369D, E
US	<u>94-24-04</u>	PITCH CONTROL ASSEMBLY LOCKWASHER	DN185 EN78 FN64	369D, E
US	<u>94-18-08</u>	LOSS OF TAIL ROTOR BLADE ABRASION STRIPS		369D, E
US	<u>93-18-05</u>	FUEL LINE EMERGENCY SHUTOFF VALVE BLOCKAGE	SIN DN-181	369D, E
US	<u>93-07-10</u>	YAW OSCILLATIONS DURING DESCENT WITH BAGGAGE POD		369D, E
CF	<u>CF-92-17</u>	FLIGHT LIMITATIONS WITH CARGO POD INSTALLED		369D, E

US	<u>91-08-02</u>	CRACKS - TAIL ROTOR BLADE ROOT FITTING	DN-177,EN-68,FN-55	369D, E
US	<u>90-01-08</u>	DRIVESHAFT COUPLING - ENGINE TO TRANSMISSION	DN-157,EN-47,	369D, E
US	<u>90-12-03</u>	TAIL ROTOR SWASHPLATE BEARING	DN-167,EN-58,FN-46	369D, E
US	<u>90-19-02</u>	OVERRUNNING CLUTCH ASSY	DN-164, EN-54, FN-44	369D, E
US	<u>90-24-07</u>	MAIN ROTOR TRANSMISSION DRIVE ASSEMBLY	EN-57,DN-166.1,FN-45	369D, E
US	<u>89-02-01R1</u>	MAIN ROTOR HUB RETENTION STRAPS	DN-154, EN-44, FN-33	369D, E
US	<u>89-20-02</u>	FOUR BLADED TAIL ROTOR HUB	DN-160, EN-50	369D, E
US	<u>89-23-14</u>	MAIN ROTOR COLLECTIVE TUBE	EN-48.1,DN-158.1	369D, E
CF	<u>CF-88-09</u>	TRANSMISSION RING GEAR CARRIER	DN-148.1,EN-36.1	369D, E
US	<u>88-17-09R1</u>	TAIL ROTOR TRANSMISSION MOUNTING STUDS	EN-39, DN-151,FN-28	369D, E
US	<u>87-18-11</u>	M/R TRANSMISSION T/R OUTPUT PINION	EN-35,DN-147,FN-24	369D, E
US	<u>86-20-07</u>	TAIL ROTOR DRIVE SHAFT	EN-31.1,DN=143.1	369D, E
US	<u>86-01-04</u>	TAIL ROTOR BLADES	EN-18&21,DN129&132	369D, E
US	<u>84-12-01R1</u>	APPROVED ROTOR BLADES	DL-57, EL-5	369D, E
US	<u>84-11-01</u>	CONTROL ROD	EN-13 SIC	369D, E
US	<u>84-01-02R1</u>	M/R SWASHPLATE BEARING	EN-12,DN-125	369D, E
US	<u>82-17-01</u>	OUTPUT GEARSHAFT ASSEMBLY	DN-148.1	369D
US	<u>82-14-01</u>	CHADWICK AUX FUEL SYSTEM	VENDOR	369D
US	<u>82-01-08</u>	LEVER CONTROL ROD	DN-87	369D
US	<u>81-26-01R1</u>	MAIN ROTOR DRIVE SHAFT	DN-99,EN-4,FN-4	369D, E
US	<u>80-25-01</u>	T/R DRIVESHAFT COUPLING		369D
US	<u>80-24-04</u>	AUTO-REIGNITION PLACARD RELOCATION	DN-100	369D
US	<u>79-10-09</u>	TAIL ROTOR PITCH CONTROL ASSY	DN-37 SIC	369D
US	<u>78-26-04</u>	TAIL ROTOR HUB ASSEMBLY	DN-27.1	369D
US	<u>78-20-03</u>	FIRE SUPPRESION SYSTEM		369D
US	<u>77-21-04</u>	CLUTCH AND SHAFT ASSEMBLY	DN-9.2	369D
US	<u>77-19-03</u>	MAIN ROTOR RETENTION STRAPS	DN-154	369D
US	<u>77-05-03</u>	TAIL ROTOR CONTROL SYSTEM	DN-1	369D

Scope:

This EMI/RMI test procedure is intended for the installation of equipment that is not critical for flight safety (e.g. aerial photo, magnetic survey, etc.). The tests should demonstrate that the equipment does not affect the aircraft systems required for flight safety, communication and navigation.

Procedure:

1. Turn off new installed equipment to be tested.
2. Ensure that all flight instruments, engine instruments, communications, and navigation equipment are turned on and functioning normally.

Some aircraft equipment can be tested on the ground, but some must be flight tested. The criteria is: if the equipment is within its full range on the ground, then a flight test is not required, i.e. oil temperature and pressure.

3. Data observed should be reasonable and stable. Equipment operation should be normal.
4. Tests to be performed while new equipment is turned on and off, and while modes or other relevant functions are changed.
5. Write "n/a" against any equipment not installed.

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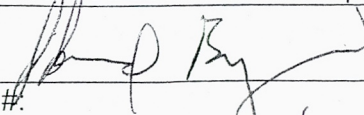
Equipment		Affected		Comments
Type	Test Procedure	System	Yes/No	
VHF Com. Radio(s) <i>KIN6</i> <i>KY196A</i>	Transmit on several channels available at test location. Operate squelch control and operate in speaker mode if applicable. Receiver should listen for static or other interference while new equipment is operated.	Com #1	<i>No</i>	
		<del>Com #2</del>		
HF Com.	Transmit on several frequencies (LO/MED/HI) in AM and SSB modes. Receiver should listen for static or other interference while new equipment is operated.	<del>HF #1</del>		
		<del>HF #2</del>		
FM Radio(s)	Transmit on several channels. Operate squelch control and operate in speaker mode if applicable. Receiver should listen for static or other interference while new equipment is operated.	FM #1	<i>No</i>	<i>KENWOOD</i>
		FM #2	<i>No</i>	<i>KENWOOD</i>
VHF Nav. Radio(s)	Operate in VOR and ILS modes. Use local stations and ramp test set if available. Observe for any erratic or erroneous indications.	<del>VHF Nav. #1</del>		
		<del>VHF Nav. #2</del>		
ADF Receiver(s)	Use at least 3 local stations. This test should be conducted outside to minimize interference from hangar electrical systems. Observe for any erratic or erroneous indications.	<del>ADF #1</del>		
		<del>ADF #2</del>		
DME Receiver(s)	Use local station or a ramp test set if available. Observe for any erratic or erroneous indications.	<del>DME #1</del>		
		<del>DME #2</del>		

Equipment		Affected		Comments
Type	Test Procedure	System	Yes/No	
GPS System(s) GARMIN GPS 150 XL	Perform a function test and monitor for any erratic or erroneous indications. Interference may be caused by transmission on the following VHF frequencies: 121.125, 121.150, 121.175, 121.200, 121.225, 121.250, 131.200, 131.225, 131.250, 131.275, 131.300, 131.325, 131.350. If DME is present, check for interference while on frequency 108.9	GPS #1	No	
		<del>GPS #2</del>		
Transponder(s) KING / BENDIX KT76A	Use ramp test set. Operate using several codes. During test, select "ident". Test the encoding altimeter in conjunction with this test. Confirm correct code is received, and that altimeter data is correct.	XPDR #1	No	NO TEST FOR XPDR
		<del>XPDR #2</del>		
Radio Altimeter(s)	Check the rad alt for any erratic or erroneous indications.	<del>Rad Alt #1</del>		
		<del>Rad Alt #2</del>		
Audio Control System(s)	Check for any undesired noise. Check Intercom function, including cabin intercom.	<del>ACS #1</del>		
		<del>ACS #2</del>		
External Lighting System	Strobe lights, rotating beacons and landing lights. Observe for any effect when system is turned on and off.			NOT CHECKED
FCS/Flight Director	Completely test all flight control system modes. This test may require a test flight, and may be carried out in conjunction with the Autopilot System test.	/		
Autopilot System	Completely test all autopilot system modes. This test may require a test flight, and may be carried out in conjunction with the FCS System test.	/		



Equipment		Affected		Comments
Type	Test Procedure	System	Yes/No	
EFIS System	Check for loss of data from all sources.	/		
Air Data Computer(s)	Perform a system function test and monitor for any erratic or erroneous indications.	Comp #1		
		Comp #2		
Flight Management System (FMS)	Perform a function test and monitor for any erratic or erroneous indications. Operate in all available modes.	/		
Weather Radar/Storm Scope	Refer to AC20-68B for safety precautions. Operate in all available modes. Observe for any erratic or erroneous indications.	/		
Flight Data Recorder (FDR)	Observe system under test with FDR system on and off.	/		
Cockpit Voice Recorder (CVR)	Observe system under test with CVR system on and off.	/		
Other Equipment (specify)				
ENGINE INST			NO	A/C GROUND RUN

The test described above has been performed in accordance with the applicable standards of airworthiness.

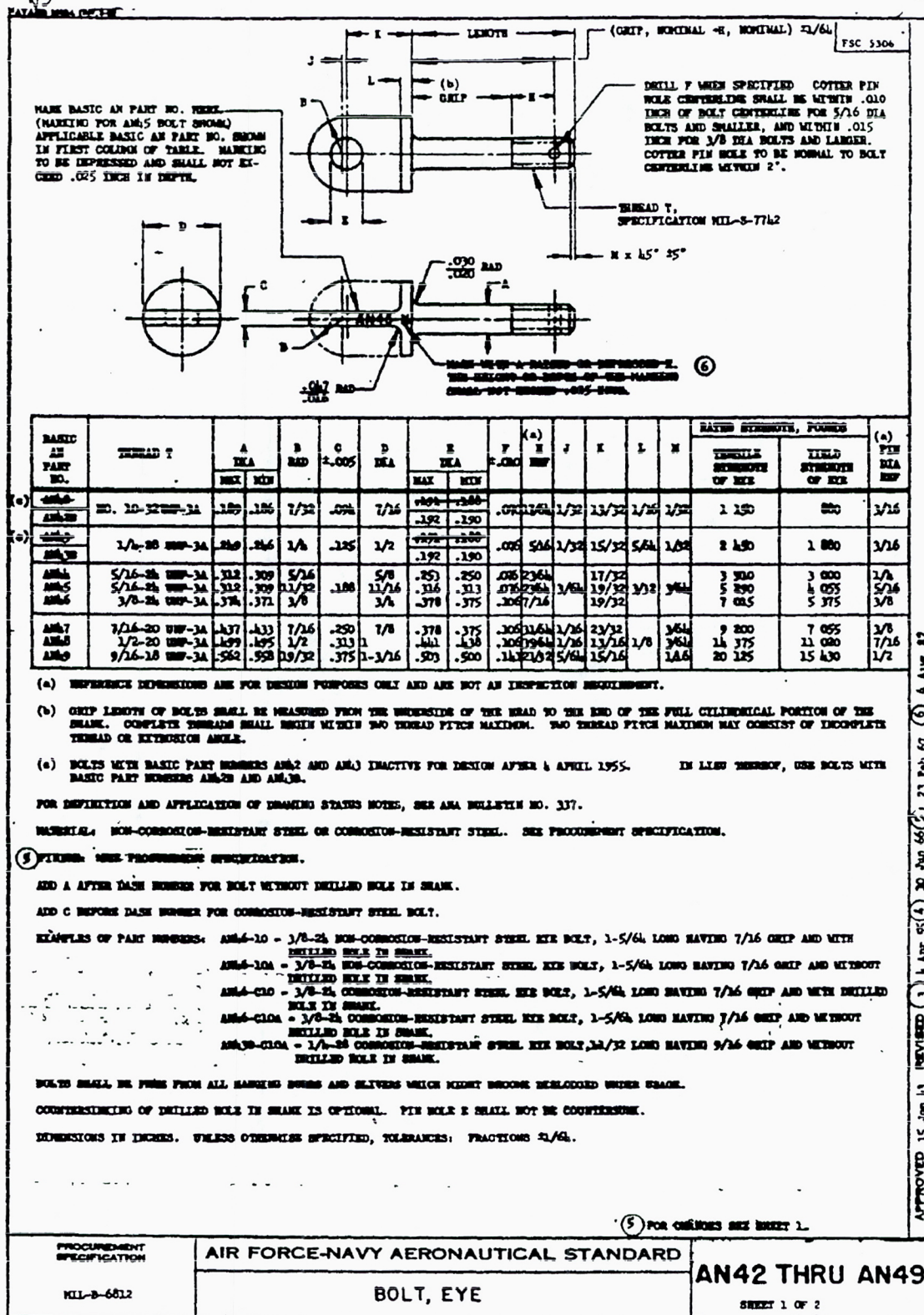
Signed: 	Date: 01 DEC 03	Aircraft Make/Model: MD369 D
Approval #: C-LSH03-097/D		Aircraft Serial No./Registration: C-GFKN



RIGHT

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AN42B-11A

SUPERSEDES FORMER AIR FORCE AND NAVY  
STANDARD ISSUES OF AN42 THROUGH AN49.



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AN42		AN43		AN44		AN45		AN46		AN47		AN48		AN49		
DASH NO.	GRIP	LENGTH +1/32 -1/64	GRIP	LENGTH +1/32 -1/64	GRIP	LENGTH +1/32 -1/64	GRIP	LENGTH +1/32 -1/64	GRIP	LENGTH +1/32 -1/64	GRIP	LENGTH +1/32 -1/64	GRIP	LENGTH +1/32 -1/64	GRIP	LENGTH +1/32 -1/64
3	1/16	15/32	1/16	17/32	1/16	19/32	1/16	19/32								
5	1/8	21/32	3/16	21/32	3/16	23/32	3/16	23/32	1/16	45/64	1/16	21/32				
6	3/8	25/32	5/16	25/32	5/16	27/32	5/16	27/32	3/16	53/64	3/16	27/32	1/16	27/32	1/16	31/32
7	1/2	29/32	7/16	29/32	7/16	31/32	7/16	31/32	5/16	61/64	5/16	31/32	3/16	31/32	1/32	1- 1/32
10	5/8	1- 1/32	9/16	1- 1/32	9/16	1- 3/32	9/16	1- 3/32	7/16	1- 5/64	7/16	1- 3/32	5/16	1- 3/32	1/8	1- 5/32
11	3/4	1- 5/32	11/16	1- 5/32	11/16	1- 7/32	11/16	1- 7/32	9/16	1- 13/64	9/16	1- 7/32	7/16	1- 7/32	3/8	1- 9/32
12	7/8	1- 9/32	13/16	1- 9/32	13/16	1- 11/32	13/16	1- 11/32	11/16	1- 21/64	11/16	1- 11/32	9/16	1- 11/32	1/2	1- 13/32
13	1	1- 13/32	15/16	1- 13/32	15/16	1- 15/32	15/16	1- 15/32	13/16	1- 29/64	13/16	1- 15/32	11/16	1- 15/32	5/8	1- 17/32
14	1- 1/8	1- 17/32	1- 1/16	1- 17/32	1- 1/16	1- 19/32	1- 1/16	1- 19/32	15/16	1- 37/64	15/16	1- 19/32	13/16	1- 19/32	3/4	1- 21/32
15	1- 1/4	1- 21/32	1- 3/16	1- 21/32	1- 3/16	1- 23/32	1- 3/16	1- 23/32	1- 1/2	1- 45/64	1- 1/2	1- 23/32	15/16	1- 23/32	7/8	1- 25/32
16	1- 3/8	1- 25/32	1- 5/16	1- 25/32	1- 5/16	1- 27/32	1- 5/16	1- 27/32	1- 3/4	1- 53/64	1- 3/4	1- 27/32	1- 1/2	1- 27/32	1	1- 29/32
17	1- 1/2	1- 29/32	1- 7/16	1- 29/32	1- 7/16	1- 31/32	1- 7/16	1- 31/32	1- 5/8	1- 61/64	1- 5/8	1- 31/32	1- 3/4	1- 31/32	1- 1/8	2- 1/32
20	1- 5/8	2- 1/32	1- 9/16	2- 1/32	1- 9/16	2- 3/32	1- 9/16	2- 3/32	1- 7/8	2- 5/64	1- 7/8	2- 3/32	1- 5/8	2- 3/32	1- 1/4	2- 5/32
21	1- 3/4	2- 5/32	1- 11/16	2- 5/32	1- 11/16	2- 7/32	1- 11/16	2- 7/32	1- 9/8	2- 13/64	1- 9/8	2- 7/32	1- 7/8	2- 7/32	2- 9/32	
22	1- 7/8	2- 9/32	1- 13/16	2- 9/32	1- 13/16	2- 11/32	1- 13/16	2- 11/32	1- 11/8	2- 21/64	1- 11/8	2- 11/32	1- 9/8	2- 11/32	1- 1/2	2- 13/32
23	2	2- 13/32	1- 15/16	2- 13/32	1- 15/16	2- 15/32	1- 15/16	2- 15/32	1- 13/8	2- 29/64	1- 13/8	2- 15/32	1- 11/8	2- 15/32	1- 5/8	2- 17/32
24	2- 1/8	2- 17/32	2- 1/16	2- 17/32	2- 1/16	2- 19/32	2- 1/16	2- 19/32	1- 15/8	2- 37/64	1- 15/8	2- 19/32	1- 13/8	2- 19/32	1- 3/4	2- 21/32
25	2- 1/4	2- 21/32	2- 3/16	2- 21/32	2- 3/16	2- 23/32	2- 3/16	2- 23/32	2- 1/2	2- 45/64	2- 1/2	2- 23/32	1- 15/8	2- 23/32	1- 7/8	2- 25/32
26	2- 3/8	2- 25/32	2- 5/16	2- 25/32	2- 5/16	2- 27/32	2- 5/16	2- 27/32	2- 3/4	2- 53/64	2- 3/4	2- 27/32	2- 1/2	2- 27/32	2- 29/32	
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30	2- 5/8	3- 1/32	2- 9/16	3- 1/32	2- 9/16	3- 3/32	2- 9/16	3- 3/32	2- 7/8	3- 5/64	2- 7/8	3- 3/32	2- 5/8	3- 3/32	2- 1/4	3- 5/32
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32	2- 7/8	3- 9/32	2- 13/16	3- 9/32	2- 13/16	3- 11/32	2- 13/16	3- 11/32	2- 11/8	3- 21/64	2- 11/8	3- 11/32	2- 9/8	3- 11/32	3- 13/32	
33	3	3- 13/32	2- 15/16	3- 13/32	2- 15/16	3- 15/32	2- 15/16	3- 15/32	2- 13/8	3- 29/64	2- 13/8	3- 15/32	2- 11/8	3- 15/32	2- 5/8	3- 17/32
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43	4	4- 13/32	3- 15/16	4- 13/32	3- 15/16	4- 15/32	3- 15/16	4- 15/32	3- 13/8	4- 29/64	3- 13/8	4- 15/32	3- 11/8	4- 15/32	3- 5/8	4- 17/32
44	4- 1/8	4- 17/32	4- 1/16	4- 17/32	4- 1/16	4- 19/32	4- 1/16	4- 19/32	3- 15/8	4- 37/64	3- 15/8	4- 19/32	3- 13/8	4- 19/32	3- 3/4	4- 21/32
45	4- 1/4	4- 21/32	4- 3/16	4- 21/32	4- 3/16	4- 23/32	4- 3/16	4- 23/32	4- 1/2	4- 45/64	4- 1/2	4- 23/32	3- 15/8	4- 23/32	3- 7/8	4- 25/32
46	4- 3/8	4- 25/32	4- 5/16	4- 25/32	4- 5/16	4- 27/32	4- 5/16	4- 27/32	4- 3/4	4- 53/64	4- 3/4	4- 27/32	4- 1/2	4- 27/32	4- 29/32	
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53	5	5- 13/32	4- 15/16	5- 13/32	4- 15/16	5- 15/32	4- 15/16	5- 15/32	4- 13/8	5- 29/64	4- 13/8	5- 15/32	4- 11/8	5- 15/32	4- 5/8	5- 17/32
54	5- 1/8	5- 17/32	5- 1/16	5- 17/32	5- 1/16	5- 19/32	5- 1/16	5- 19/32	4- 15/8	5- 37/64	4- 15/8	5- 19/32	4- 13/8	5- 19/32	4- 3/4	5- 21/32
55	5- 1/4	5- 21/32	5- 3/16	5- 21/32	5- 3/16	5- 23/32	5- 3/16	5- 23/32	5- 1/2	5- 45/64	5- 1/2	5- 23/32	4- 15/8	5- 23/32	4- 7/8	5- 25/32
56	5- 3/8	5- 25/32	5- 5/16	5- 25/32	5- 5/16	5- 27/32	5- 5/16	5- 27/32	5- 3/4	5- 53/64	5- 3/4	5- 27/32	5- 1/2	5- 27/32	5- 29/32	
57	5- 1/2	5- 29/32	5- 7/16	5- 29/32	5- 7/16	5- 31/32	5- 7/16	5- 31/32	5- 5/8	5- 61/64	5- 5/8	5- 31/32	5- 3/4	5- 31/32	5- 1/8	6- 1/32
60	5- 5/8	6- 1/32	5- 9/16	6- 1/32	5- 9/16	6- 3/32	5- 9/16	6- 3/32	5- 7/8	6- 5/64	5- 7/8	6- 3/32	5- 5/8	6- 3/32	5- 1/4	6- 5/32
61	5- 3/4	6- 5/32	5- 11/16	6- 5/32	5- 11/16	6- 7/32	5- 11/16	6- 7/32	5- 9/8	6- 13/64	5- 9/8	6- 7/32	5- 7/8	6- 7/32	5- 3/8	6- 9/32
62	5- 7/8	6- 9/32	5- 13/16	6- 9/32	5- 13/16	6- 11/32	5- 13/16	6- 11/32	5- 11/8	6- 21/64	5- 11/8	6- 11/32	5- 7/8	6- 11/32	5- 1/2	6- 13/32
63	6	6- 13/32	5- 15/16	6- 13/32	5- 15/16	6- 15/32	5- 15/16	6- 15/32	5- 13/8	6- 29/64	5- 13/8	6- 15/32	5- 11/8	6- 15/32	5- 5/8	6- 17/32
64	6- 1/8	6- 17/32	6- 1/16	6- 17/32	6- 1/16	6- 19/32	6- 1/16	6- 19/32	5- 15/8	6- 37/64	5- 15/8	6- 19/32	5- 13/8	6- 19/32	5- 3/4	6- 21/32
65	6- 1/4	6- 21/32	6- 3/16	6- 21/32	6- 3/16	6- 23/32	6- 3/16	6- 23/32	6- 1/2	6- 45/64	6- 1/2	6- 23/32	5- 15/8	6- 23/32	5- 7/8	6- 25/32
66	6- 3/8	6- 25/32	6- 5/16	6- 25/32	6- 5/16	6- 27/32	6- 5/16	6- 27/32	6- 3/4	6- 53/64	6- 3/4	6- 27/32	6- 1/2	6- 27/32	6- 29/32	
67	6- 1/2	6- 29/32	6- 7/16	6- 29/32	6- 7/16	6- 31/32	6- 7/16	6- 31/32	6- 5/8	6- 61/64	6- 5/8	6- 31/32	6- 3/4	6- 31/32	6- 1/8	7- 1/32
70	6- 5/8	7- 1/32	6- 9/16	7- 1/32	6- 9/16	7- 3/32	6- 9/16	7- 3/32	6- 7/8	7- 5/64	6- 7/8	7- 3/32	6- 5/8	7- 3/32	6- 1/4	7- 5/32
71	6- 3/4	7- 5/32	6- 11/16	7- 5/3												

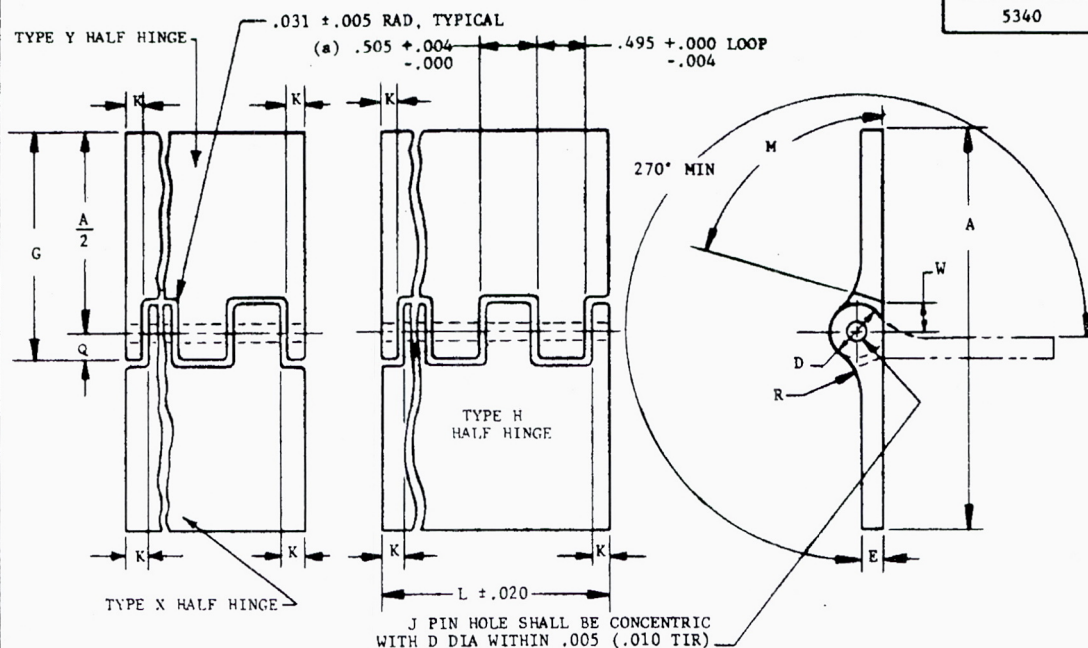


USER SYMBOLS:

REVIEWER SYMBOLS:  
DIA - IS

"Review/user information is current as of the date of this document. For future coordination of changes to this document, draft circulation should be based on the information in the current DODISS."

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FED. SUP CLASS  
5340

TABLE I

DASH NO.	A REF WIDTH OPEN	E		G		Q ±.005	J DIA +.005 - .000	(b) K MIN	D DIA		R ±.031 RAD	W ±.016	PIN DIA REF	M ±2°
		MAX	MIN	MAX	MIN				MAX	MIN				
-2	1.062			.630	.612									
-3	1.250			.724	.706									
-4	1.500	.056	.044	.850	.830	.090	.093		.187	.173	.174	.135	.090	75°
-5	1.750			.975	.955									
-6	2.000			1.102	1.078									
-8	2.000	.076	.064	1.167	1.143	.155	.183	.188	.318	.302	.297	.200	.180	
-9	2.500	.056	.044	1.352	1.328	.090	.093		.187	.173	.174	.135	.090	
-10	2.750			1.477	1.453				.320	.304	.375	.188		60°
-12	3.375	.115	.103	1.860	1.828	.156			.414	.398	.625	.240	.130	45°
-14	3.719	.163	.149	2.086	2.038	.203	.133		.509	.491	.750	.287	.180	
-16	3.938	.210	.196	2.243	2.195	.250	.183							
-17	1.820	.056	.044	1.102	1.078	.090	.093		.187	.173	.174	.135	.090	75°

\* CANCELLED - NO SUPERSEDING PART NUMBER

- (a) TOLERANCES FOR DIMENSIONS ON PITCH SHALL NOT BE CUMULATIVE.  
(b) DIMENSION K MUST NEVER EXCEED A FULL LOOP OR TANG, AND BOTH ENDS MUST BE EQUAL WITHIN .020 INCH.

INTERCHANGEABILITY RELATIONSHIP:  
MS20001 HINGES ARE NOT UNIVERSALLY INTERCHANGEABLE WITH AN252 HINGES. FOR INTERCHANGEABILITY RELATIONSHIP SEE TABLE II.

TABLE II

INTERCHANGEABILITY TABLE		
INACTIVE AND CANCELLED	UNIVERSALLY INTERCHANGEABLE	REPLACEABLE WITH
AN252-1	-----	-----
AN252-2	MS20001-2	-----
AN252-4	MS20001-4	-----
AN252-6	MS20001-6	-----
AN252-8	MS20001-8	-----
AN252-10	MS20001-10	-----

(K) DENOTES CHANGES

P.A. NAVY - AS Other Cust  USAF - 99 ARMY - AV	TITLE	MILITARY STANDARD
	HINGE, BUTT, STRUCTURAL, EXTRUDED	MS20001
PROCUREMENT SPECIFICATION NONE	SUPERSEDES: AN252	SHEET 1 OF 2

DD FORM 672-1 (Coordinated)

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE

PROJECT NO. 5340-1656

PLATE NO. 23065

APPROVED 25 JAN 51 REVISED F 15 November 1976 C 5 September 1980 H 2 MAR 83 J 28 SEPT 84 K 30 AUG 85

WALL  
DISPLAY

USER SYMBOLS:

REVIEWER SYMBOLS:

DLA - IS

"Review/user information is current as of the date of this document. For future coordination of changes to this document, draft circulation should be based on the information in the current DODISS."

This military standard is approved for use by all Departments & Agencies of the Department of Defense. Selection for all new engineering and design applications and for repetitive use shall be made from this document.

#### REQUIREMENTS:

- (K) 1. MATERIAL: ALUMINUM ALLOY 2024-T3511, PER QQ-A-200/3, OR ALUMINUM ALLOY 7075-T73511, PER QQ-A-200/11 (SEE PART NUMBERING)
2. FINISH: ANODIZE IN ACCORDANCE WITH MIL-A-8625, TYPE II; CHEMICAL SURFACE TREAT IN ACCORDANCE WITH MIL-C-5541; (ENDS OF ALL HINGES SHALL BE FINISHED)
3. MARKING: INK STAMP MS20001 (DASH NUMBER) REGULAR INTERVALS ALONG LENGTH OF HINGE SO THAT ANY THREE INCH LENGTH WILL HAVE AT LEAST ONE COMPLETE IDENTIFICATION IN FIGURES NOT LESS THAN .060 INCHES HIGH. SEE NOTE 5.
4. COMPLETE HINGES SHALL BE FURNISHED AS AN ASSEMBLY WITH CAD PLATED CRES HINGE PINS OF THE SAME LENGTH IN ACCORDANCE WITH MS20253 ~~UNLESS TITANIUM HINGE PIN IN ACCORDANCE WITH MS20253 ARE SPECIFIED~~ (SEE PART NUMBERING)
5. DESIGNATION FOR ANODIZING, CHEMICAL SURFACE TREATMENT, HINGE STYLE, AND LENGTH SHALL NOT BE INCLUDED IN MARKING.
6. ONLY COMPLETE HINGES TO BE STOCKED BY SERVICES.
7. USE MS20257 HINGE WHEREVER LOAD REQUIREMENTS PERMIT.

#### NOTES:

1. DIMENSIONS IN INCHES.
2. REMOVE ALL BURRS AND SHARP EDGES.
3. TYPE X HALF HINGE MATES WITH TYPE Y HALF HINGE, AS SHOWN.
4. TYPE H HALF HINGE MATES WITH TYPE H HALF HINGE.
5. FOR SERVICE PROCUREMENT, THE PREFERRED STOCK LENGTH OF COMPLETE HINGES IS 72 INCHES.
6. PART NUMBERING: (NOMENCLATURE TO BE INCLUDED ON SHIPPING DOCUMENTS ONLY)  
PART NUMBERING SHALL CONSIST OF THE FOLLOWING (IN SEQUENCE)
  - a. MS20001
  - b. "P" FOR ANODIZED FINISH; "C" FOR CHEMICAL SURFACE TREATMENT; OMISSION OF CODE LETTER WILL INDICATE BARE FINISH.
  - c. "H", "X", OR "Y" TO DESIGNATE HALF HINGE STYLE; OMISSION OF CODE LETTER WILL INDICATE COMPLETE HINGE.
  - (K) d. "A" FOR 7075-T73511 ALUMINUM ALLOY HINGE; OMISSION OF "A" WILL INDICATE 2024-T3511 ALUMINUM ALLOY.
  - ~~e. "T" FOR TITANIUM HINGE PIN (FOR COMPLETE HINGE ONLY); OMISSION OF "T" WILL INDICATE CADMIUM-PLATED CRES HINGE PIN.~~
  - f. DASH NUMBER (TABLE I); OMIT DASH IF PRECEDED BY CODE LETTER.
  - g. A DASH FOLLOWED BY LENGTH "L" EXPRESSED IN INCHES AND HUNDREDTHS.
7. EXAMPLES OF PART NUMBERS:
  - (K) MS20001-4-1200 = COMPLETE HINGE, BARE FINISH, ALUM. 2024-T3511, CAD PLATED CRES HINGE PIN, 1.500 INCHES WIDE, 12.00 INCHES LONG.
  - MS20001CHA4-1200 = TYPE H HALF HINGE, CHEMICAL SURFACE TREATMENT, ALUM. 7075-T73511, 1.500 INCHES WIDE, 12.00 INCHES LONG.
8. DO NOT SPECIFY "P" FOR ANODIZE IF HINGE IS TO BE SPOTWELDED.
9. REFERENCED DOCUMENTS SHALL BE OF THE ISSUE IN EFFECT ON DATE OF INVITATION FOR BIDS, OR REQUEST FOR PROPOSAL EXCEPT THAT REFERENCED ADOPTED INDUSTRY DOCUMENTS SHALL GIVE THE DATE OF THE ISSUE ADOPTED.
10. FOR DESIGN FEATURE PURPOSES, THIS STANDARD TAKES PRECEDENCE OVER PROCUREMENT DOCUMENTS REFERENCED HEREIN.

P.A. NAVY - AS Other Cust USAF - 99 ARMY - AV	TITLE  HINGE, BUTT, STRUCTURAL, EXTRUDED	MILITARY STANDARD	
		MS20001	
PROCUREMENT SPECIFICATION NONE	SUPERSEDES:  AN252	SHEET 2	OF 2

DD FORM 672-1 (Coordinated)  
1 MAR 72

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE.

PLATE NO. 23065

☆ U.S. GOVERNMENT PRINTING OFFICE: 1985 — 505-038/24008

APPROVED 25 JAN 51 REVISED (K) FOR CHANGES SEE SHEETS 1 AND 2

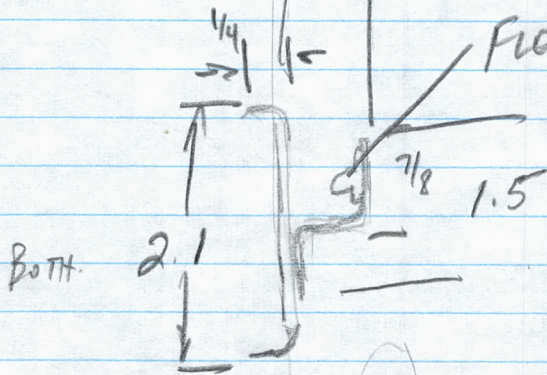


# COLLECTIVE - BASE WORKS

0.040 MAT'L

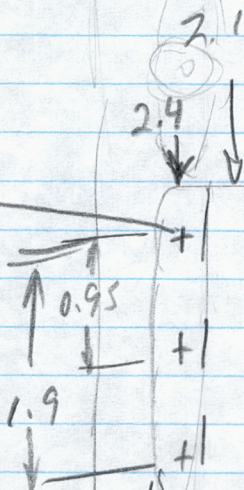
0.680 FWD } TOP 0.690 BOTH BOTTOM  
0.690 AFT UNDS.

FLOATING ANCHOR NUT.  
Ø 0.21 IN FRONT.



6x  
BLIND RIVET  
Ø 0.23 HEAD

TOP



2.0

4.85 @ RIV

4 1/4 RIV

4 3/4 RIV

5 RIV

1 1/4

5.5 @ RIV

1.16

1

INSIDE

1 1 1

ASSUME  
VERTICAL

0.063  
7/8 3/16

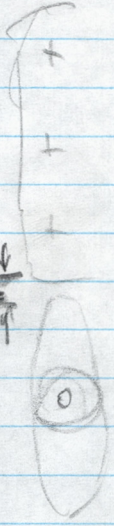
3/4

PEER  
EDGE  
LOOKING DWN  
SEAL

3/4

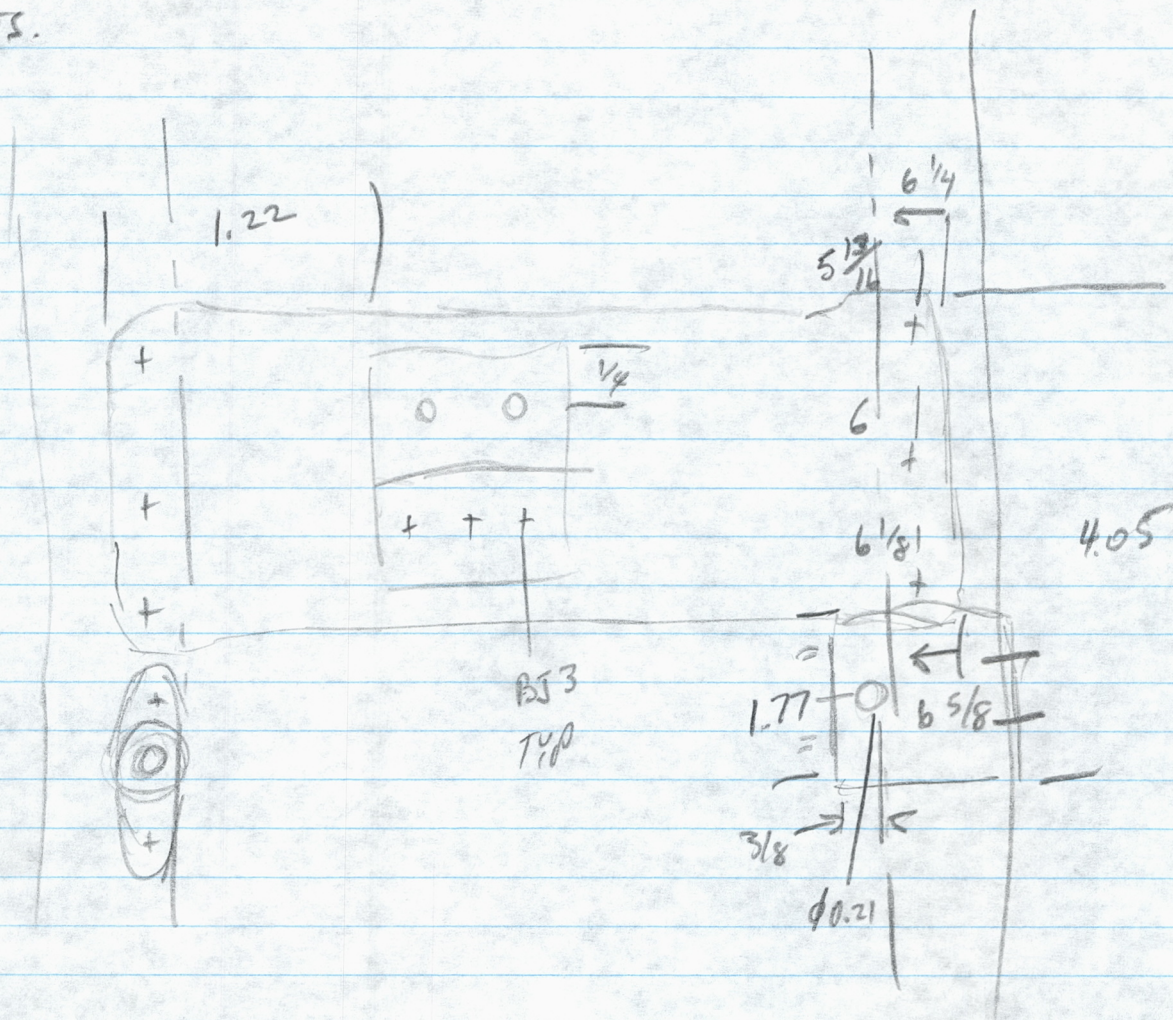
WINDOW

0.050  
TYPICAL





Bottom Brkts.





Main Menu .....X  
Book TOC .....X  
Chapter TOC ..X

The Boeing Company  
MAINTENANCE MANUAL

CSP-HMI-2

## FIRE EXTINGUISHER MAINTENANCE PRACTICES

### 1. Fire Extinguisher - General

(Ref. Figure 201) The early model helicopters use the pressurized, dry chemical type of fire extinguisher. The current models use a liquified gas which discharges as a vapor at high nozzle velocity. The L/H and R/H command fire extinguishers mount on the forward door frame between the crew door and the canopy. The fire extinguisher quickly detaches from the mounting bracket by unfastening the quick-release clasps. Note the current fire extinguishers are equipped with two straps for extra high vibration applications.

### 2. Fire Extinguisher Operation

- a. Grasp fire extinguisher handle with one hand. Use the thumb and forefinger of the other hand to unfasten the quick-release clasp.
- b. Remove fire extinguisher from mounting bracket.
- c. Remove safety pin from handle. Point nozzle toward base of flame and squeeze the handle.

### 3. Fire Extinguisher Servicing/ Inspection

The fire extinguishers are equipped with a pressure gage that indicates normal, charge, and overcharge pressures.

- a. Dry chemical type - white area indicates normal operating range of 150 psi. Red area indicates CHARGE or OVERCHARGE.
- b. Halon type - green area indicates normal operating range of 125 psi. Red area indicates CHARGE or OVERCHARGE.

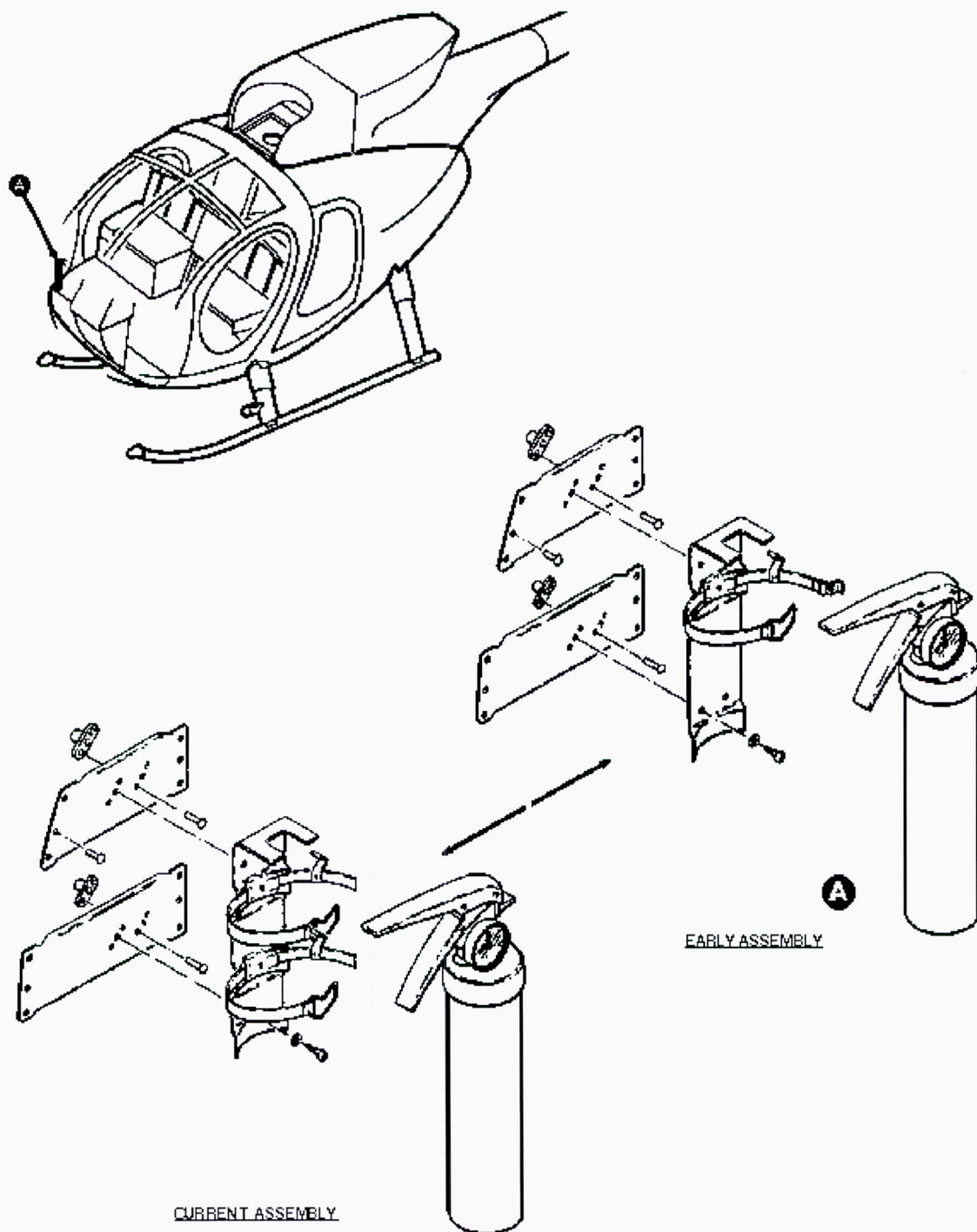
Service the fire extinguishers in accordance with manufacturer's instructions.

EFFECTIVITY: ALL
------------------

26-20-00

Page 201  
Original

CSP-HMI-2

The Boeing Company  
MAINTENANCE MANUALMain Menu ....x  
Book TOC ....x  
Chapter TOC ...x

G26-2001

Figure 201. Fire Extinguisher Installation (R/H)

Page 202  
Original**26-20-00**

EFFECTIVITY: ALL

Revision 0-

02 February, 2004  
Page 19



**Fire Protection****529.851 Fire Extinguishers**

= FAR 29.851

(a) Hand fire extinguishers. For hand fire extinguishers the following apply:

FROM ORIGINAL  
ISSUE

- (1) each hand fire extinguisher shall be approved;
- (2) the kinds and quantities of each extinguishing agent used shall be appropriate to the kinds of fires likely to occur where that agent is used; and
- (3) each extinguisher for use in a personnel compartment shall be designed to minimize the hazard of toxic gas concentrations.

NO REVISIONS

(b) Built-in fire extinguishers. If a built-in fire extinguishing system is required:

- (1) the capacity of each system, in relation to the volume of the compartment where used and the ventilation rate, shall be adequate for any fire likely to occur in that compartment;
- (2) each system shall be installed so that:
  - (i) no extinguishing agent likely to enter personnel compartments will be present in a quantity that is hazardous to the occupants, and
  - (ii) no discharge of the extinguisher can cause structural damage.

**Fire Protection****523.851 Fire Extinguishers** = FAR 23.851, AMDT 23-45

- (a) There must be at least one hand fire extinguisher for use in the pilot compartment that is located within easy access of the pilot while seated.
- (b) There must be at least one hand fire extinguisher located conveniently in the passenger compartment:
  - (1) Of each aeroplane accommodating more than 6 passengers; and
  - (2) Of each commuter category aeroplane.
- (c) For hand fire extinguishers, the following apply:
  - (1) The type and quantity of each extinguishing agent used must be appropriate to the kinds of fire likely to occur where that agent is to be used.
  - (2) Each extinguisher for use in a personnel compartment must be designed to minimize the hazard of toxic gas concentrations.

(Change 523-1 (88-01-01))

(Change 523-4 (96-09-01))

FAR 23.851 ADDED AT AMDT 23-34 (1987)

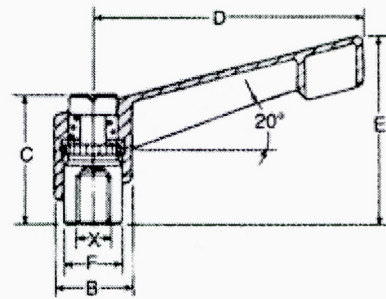
Phone: 800-441-2751 Fax: 717-692-2120

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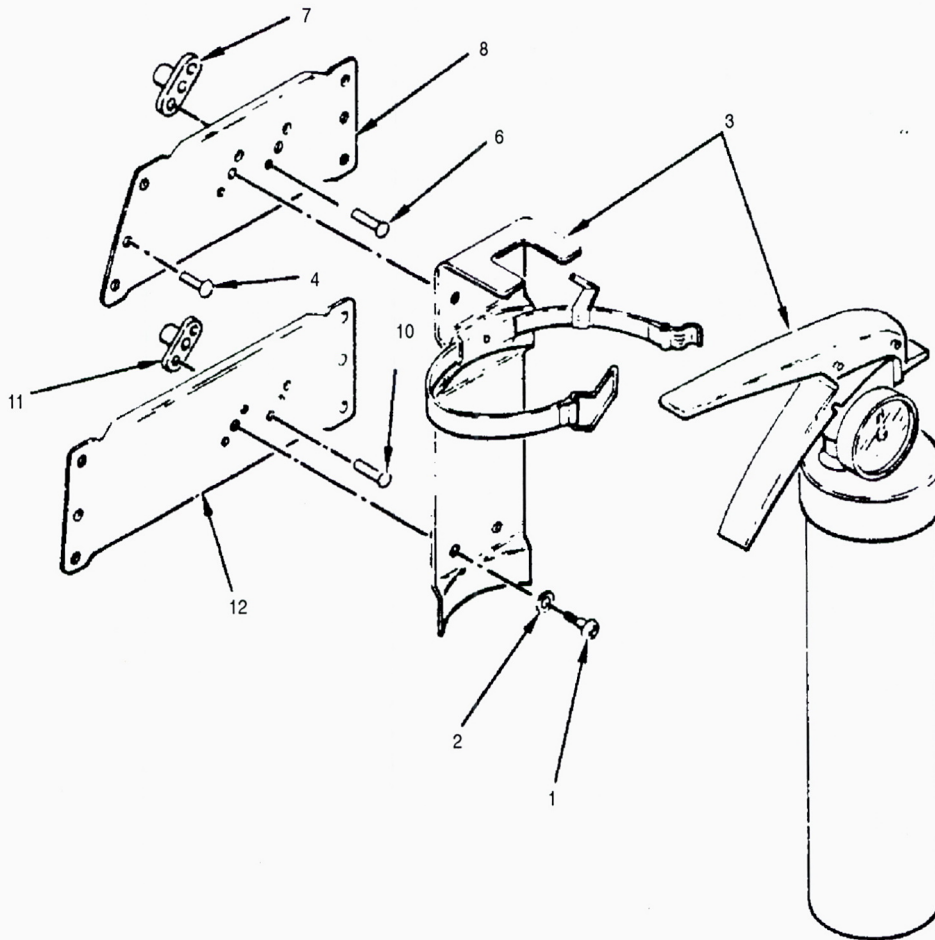
## Adjustable Clamping Levers



- Black thermoplastic handle with metal insert
- Zinc die-cast handle with black finish
- All steel parts ensure durability
- Internal thread with black oxide finish

Plastic Handle Part #	Die-Cast Handle Part #	X Thread	B	C	D	E	F
AH-101 <a href="#">View Pricing</a>	MH-101 <a href="#">View Pricing</a>	#10-24	.55	.95	1.65	1.30	.39
AH-102 <a href="#">View Pricing</a>	MH-102 <a href="#">View Pricing</a>	#10-32	.55	.95	1.65	1.30	.39
AH-103 <a href="#">View Pricing</a>	MH-103 <a href="#">View Pricing</a>	1/4"-20	.55	.95	1.65	1.30	.39
AH-104 <a href="#">View Pricing</a>	MH-104 <a href="#">View Pricing</a>	1/4"-20	.71	1.22	2.56	1.77	.53
AH-105 <a href="#">View Pricing</a>	MH-105 <a href="#">View Pricing</a>	5/16"-18	.71	1.22	2.56	1.77	.53
AH-106	MH-106	5/16"-18	.86	1.41	3.07	2.12	.63





P26-2001A

Figure 1. Fire Extinguisher Installation

I L L	Fig. No.	Item No.	Part Number	Description	Qty. per Assy.	Used on Code	Model / Serial No. From - To
	1		369H90001-501	• Fire Extinguisher Installation .....	1		ALL 000001-SUBS
	1	1	NAS623-3-3	• • Screw, Machine, Aircraft, Pan Head .....	4		
	1	2	AN960KD10	• • Washer, Flat .....	4		
	1	3	KCP 2 1/2	• • Fire Extinguisher .....	1		
	1	3	CP 2 3/4	• • Fire Extinguisher Interchangeable With Kcp 2 1/2 .....	1		
	1	3	352T	• • Fire Extinguisher One Way .....	1		
	1	4	P4	• • Rivet .....	12		
	1	4	CR2249-4	• • Rivet Interchangeable With P4 .....	12		
N	1	5	369H92001-4	• • Bracket Assy .....	1		
	1	6	MS20426AD3	• • • Rivet, Solid, Countersunk .....	4		
	1	7	NAS686A314	• • • Nutplate .....	2		
	1	8	369H92001-8	• • • Bracket .....	1		
N	1	9	369H92001-6	• • Bracket Assy .....	1		
	1	10	MS20426AD3	• • • Rivet, Solid, Countersunk .....	4		
	1	11	NAS68643K	• • • Nutplate .....	2		
	1	12	369H92001-10	• • • Bracket .....	1		

## 4.0 LOADS

### 4.1 PROCESSOR UNIT

#### Weights

Processor unit	13.0 lb.
Mount	<u>2.5 lb.</u>
	15.5 lb.

#### Forward Emergency Landing Condition Load

$$P_{ult} = 15.5 \times 4$$

$$= 62 \text{ lb.}$$

Ref: FAR 27.561

CAR 6 REQ.  
SAME

80 lb. pull alone + combined  
w/ down LOAD.

#### Upward Emergency Landing Condition Load

$$P_{ult} = 15.5 \times 1.5$$

$$= 23.3 \text{ lb}$$

Ref: FAR 27.561

25 lb.

#### Sideward Emergency Landing Condition Load

$$P_{ult} = 15.5 \times 2.0$$

$$= 31 \text{ lb}$$

Ref: FAR 27.561

60 lb tested.

#### Downward Emergency Landing Condition Load

$$P_{ult} = 15.5 \times 4$$

$$= 62 \text{ lb}$$

Ref: FAR 27.561

#### Downward Maneuvering Load

$$P_{ult} = 15.5 \times 3.5 \times 1.5$$

$$= 81.4 \text{ lb}$$

Ref: FAR 27.337

WT QTY 1  
 $9 \times 6 = 54$   
 $2.9 \times 11 = 31.9$   
 $13.5 \times 1 = 13.5$   
 99.4 lb.  
 + AL PLATE

BELL  
BALANCE





<b>Current Information, directly from the Official Canadian Civil Aircraft Register database.</b>
---

<i>Mark</i>	C-GTNM	<i>Serial No</i>	490485D
<i>Common Name</i>	Hughes	<i>Model</i>	369D
<i>Base Of Op. - Country</i>	CANADA		
<i>Base Of Op. - Province</i>	British Columbia		
<i>Base Of Op. - Location</i>	Powell River		
<i>File Location</i>	Edmonton	<i>Basis for Eligibility for Registration</i>	Type Certificate - H3WE
<i>Reg Purpose Category</i>	Commercial Helicopter	<i>Weight (Kgs)</i>	1361
<i>Manufacturer</i>	Hughes Helicopters Div. - Summa Corp.		
<i>Year of Manufacture</i>	1979		
<i>Country of Manufacture</i>	U.S.A.		

**Owner Registration**

<i>Owner Registered Since</i>	2001-11-27	<i>Last Certificate of Registration Issued</i>	2001-11-27
<i>Engine</i>	Turbo Shaft	<i>Number of Engines</i>	1

**Owner Information**

<i>Name ( 1 of 4 )</i>	Great Slave Helicopters Ltd	<i>Mail Recipient</i>	Yes
<i>Address</i>	Bag 7500		
<i>City</i>	Yellowknife	<i>Province</i>	Northwest Territories
<i>Postal Code</i>	X1A 2R3	<i>Region</i>	Prairie and Northern
<i>Name ( 2 of 4 )</i>	3542564 Canada Inc.	<i>Mail Recipient</i>	No
<i>Trade Name Used</i>	Sahtu Helicopters		
<i>Address</i>	#26 Yellowknife Airport		
<i>City</i>	Yellowknife	<i>Province</i>	Northwest Territories
<i>Postal Code</i>	X1A 3T2	<i>Region</i>	Prairie and Northern
<i>Name ( 3 of 4 )</i>	Denendeh Helicopters Ltd.	<i>Mail Recipient</i>	No
<i>Address</i>	#22 Yellowknife Airport		
<i>City</i>	Yellowknife	<i>Province</i>	Northwest Territories

<i>Postal Code</i>	X1A 3T2	<i>Region</i>	Prairie and Northern
<i>Name ( 4 of 4 )</i>	Hudson Bay Helicopters Ltd.	<i>Mail Recipient</i>	No
<i>Address</i>	Bag 7500		
<i>City</i>	Yellowknife	<i>Province</i>	Northwest Territories
<i>Postal Code</i>	X1A 2R3	<i>Region</i>	Prairie and Northern